OMMAND AND GENERAL STAFF SCHOOL

ort Leavenworth, Kansas

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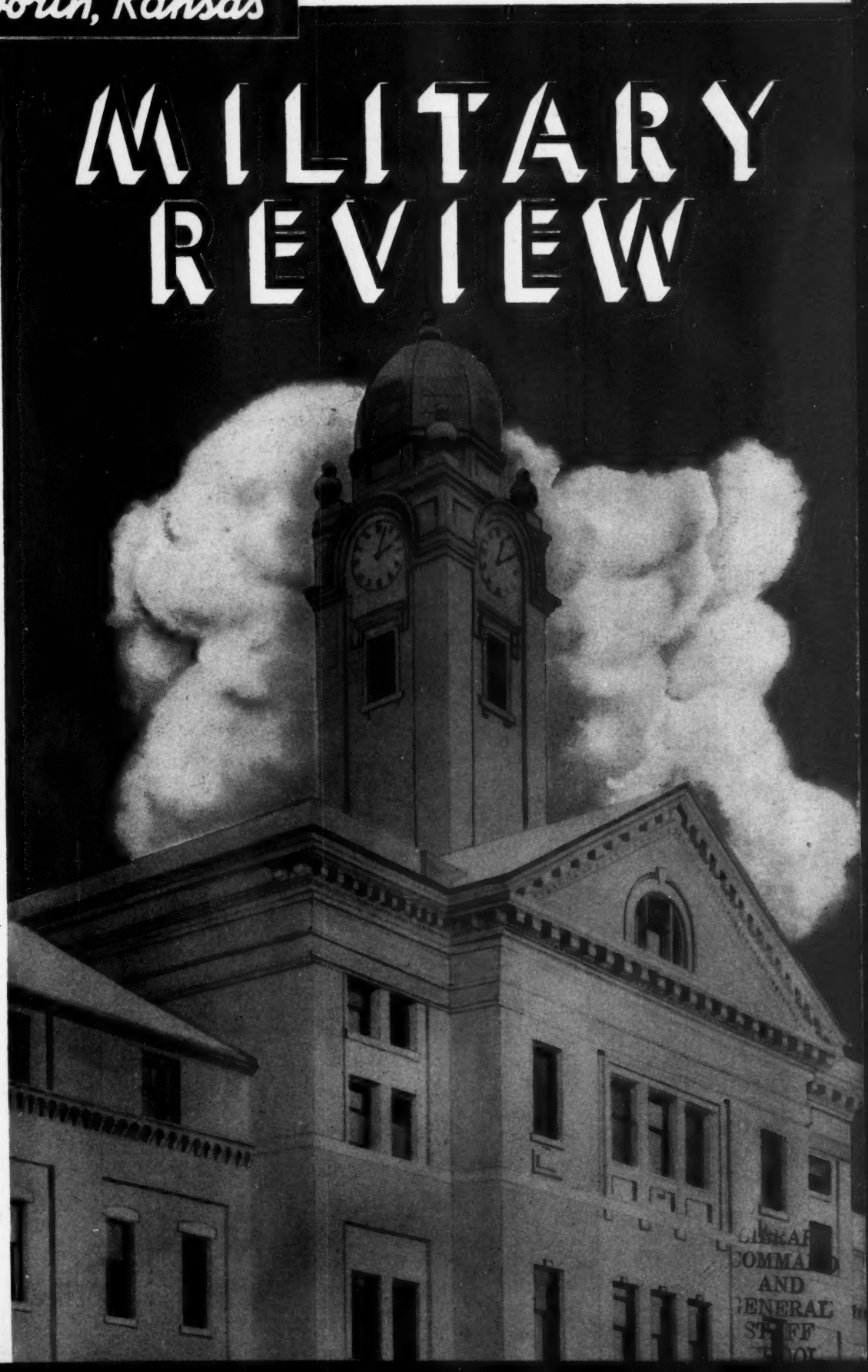

COMMAND AND GENERAL STAFF SCHOOL
OFFICE OF THE COMMANDANT
FORT LEAVENWORTH, KANSAS

25 November 1942

Colonel F. M. Barrows, Field Artillery
Editor, Military Review
Command and General Staff School
Fort Leavenworth, Kansas

Dear Barrows:

The courses of instruction now given by this School have materially enlarged its original mission. Today it is the highest academic training school in the Army and covers subjects which in time of peace were included in the studies of the former Army War College and the Army Industrial College. The foregoing, together with the increasingly large number of graduates returning to duty in the Ground Forces, the Air Forces and the Services of Supply both at home and overseas, make it necessary that the scope of the MILITARY REVIEW reflect the changed mission of the School and endeavor to serve all its graduates.

In keeping with the sources from which our students are drawn, subject matter should be appropriately balanced to meet their requirements, particularly as regards the Air Forces and the current operation of the Services of Supply in its support of the field forces - ground and air.

The articles and material presented in the MILITARY REVIEW should be such as would assist prospective students as well as serve them after graduation. Emphasis should be placed on that material which reflects our current strategic operations, anticipating such objectives in tactical and logistical aspects.

The high literary standard and quality of the MILITARY REVIEW, together with its professional reputation, must be maintained - regardless of cost.

Sincerely,

KARL TRUESDELL
Major General, U.S. Army

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COLONEL CHARLES R. BATHURST ---------- *The "Infantry Pioneer"—Panacea or Fallacy?*

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COLONEL C. R. BATHURST, *Corps of Engineers* ---------- Services of Supply Section

The Armored Force

By
LIEUTENANT GENERAL JACOB L. DEVERS, *United States Army*
Commanding General, Armored Forces

Contrary to common belief the American Armored Force antedates the formation in 1940 of our present Armored Force. In World War I we had an American Tank Corps, consisting of tank battalions and tank brigades equipped with French Renault tanks. This corps, formed in the infancy of tank warfare, performed the duties well and covered itself with glory, but it no more resembled our modern well-balanced armored division than did its Renault tanks resemble our fast, hard hitting, heavily gunned M4 medium tanks. (See Figure 1.)

Figure 1. THE MEDIUM, M4 TANK.

After World War I the Tank Corps became inactive; its units—separate tank companies, battalions, and regiments—were made part of the infantry. Later two cavalry regiments were formed into a mechanized brigade to which was attached a battalion of truck-drawn 75-mm field artillery howitzers. This brigade, together with the infantry tank units and another infantry regiment, formed in 1940 the nucleus of our present Armored Force.

The Armored Force combat units are organized into armored corps, armored divisions, tank groups,

and separate tank battalions. Tables of organization are based upon simplicity, the American fighting instinct and a careful study of the organization of foreign armored units.

Tank groups consisting of a group headquarters and three light or medium tank battalions are organized for direct support of infantry, motorized and

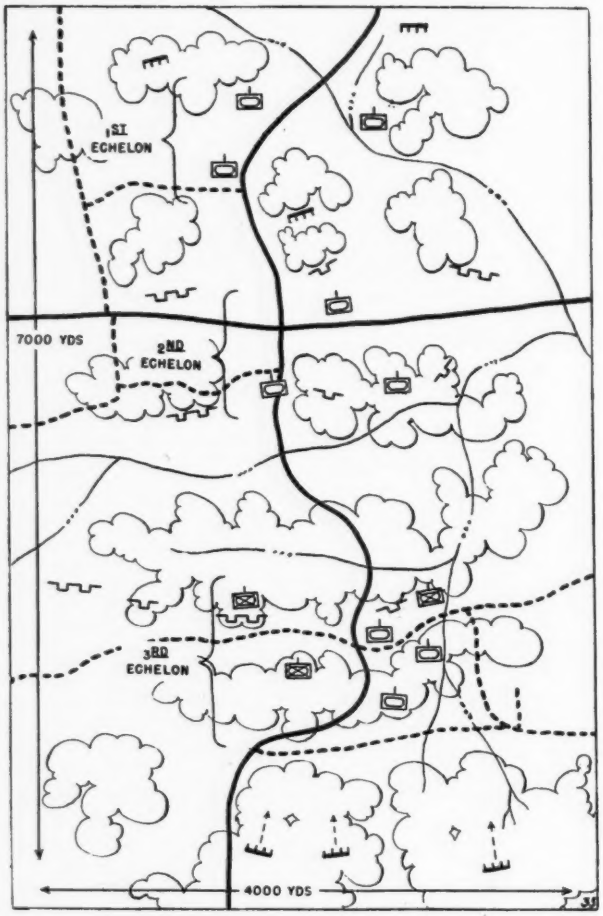


Figure 2.
ECHELONS OF ATTACK.

cavalry divisions. They may be used to reinforce armored divisions. Their mission, however, is to furnish a powerful armored reinforcement for other troops. They are used by group or battalion but must not be split into smaller units as the fundamental of mass employment will be violated and ineffectual action may result.

The armored corps may consist of two or more armored divisions and one or more motorized divisions, together with corps troops. It may act alone or in conjunction with other arms in highly mobile warfare. Its greatest strategic use is employment in enemy rear areas.

The armored division is the smallest armored unit of the combined arms. It is tactically and administratively self contained. The division consists of armored and infantry regiments; 105-mm Howitzer, reconnaissance and armored engineer battalions; service troops—medical, ordnance and supply; signal personnel; attached observation aviation and tank destroyers. It should have antiaircraft automatic weapons attached.

A rigid tactical organization has been found to be defective in this war. Any organization must provide flexibility to meet varying conditions of terrain and the enemy situation. To provide for this flexibility, the division headquarters has two combat command detachments, each commanded by a brigadier general. Using these detachments for command purposes, task forces varying in strength and composition to meet the particular situation are formed. Each such task force will normally contain reconnaissance, tank, infantry, artillery, and engineer elements and will be supported by appropriate maintenance and medical personnel.

The armored division is organized for offensive warfare. Even on defense it must be used offensively as a reserve for counterattacks. Its tanks are not used as pill boxes. Such use fails to take advantage of the characteristics of mobility.

The armored division operates by surprise, in mass, against decisive objectives. It must not be split up into numerous small task forces as by such action its full strength cannot be utilized against a

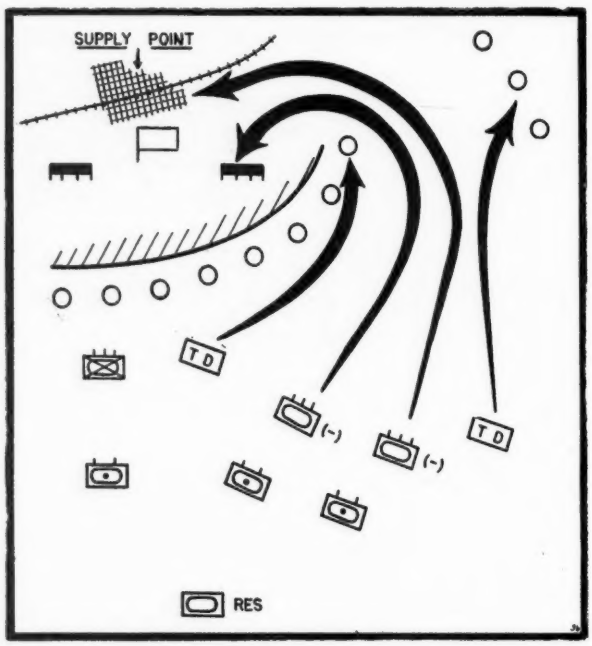


Figure 3.
ARMORED DIVISION IN ENVELOPMENT. RECONNAISSANCE UNITS OR INFANTRY FIX THE ENEMY. TANKS MAKE THE ENVELOPMENT. TANK DESTROYERS PROTECT FLANKS.

decisive objective. The division organization is balanced as to tanks, reconnaissance, artillery, infantry and engineers. The detachment of any of these units by higher commanders may seriously interfere with the division's operation.

Armored tactics consist of finding the enemy, locating his weak spots, fixing him, and then hitting

with a mass of tanks supported by all available weapons. We do not try to hit the enemy where he is strong. Launching a tank attack against an enemy strong in antitank defense is fatal. We find the weak spot or we create the weak spot by use of infantry, artillery, and air bombardment. The tanks then

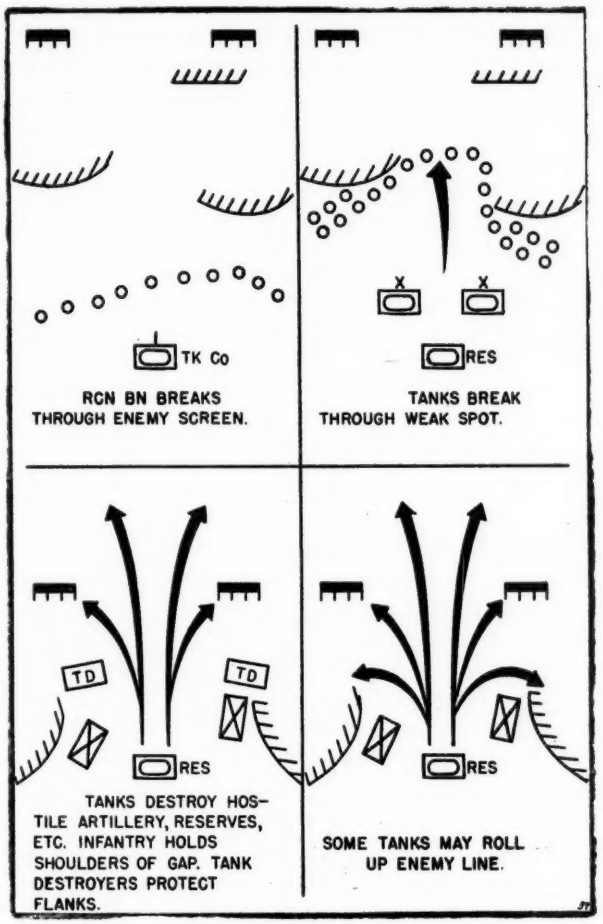


Figure 4.
IN PENETRATION SEEK SOFT SPOT AND LAUNCH A MASS TANK ATTACK THROUGH IT.

rush through and complete the enemy's destruction. After closing with the enemy, tanks operate as do infantry and cavalry, by fire and maneuver.

Combat commands usually attack in three echelons each in a series of waves.

The first echelon consisting of tanks supported by artillery and bombardment aviation, has the mission of destroying the enemy antitank guns and artillery. It continues on and destroys communication centers and supply installations.

The second echelon consisting of tanks has the mission of destroying hostile small caliber automatic weapons, hostile personnel, and antitank guns passed over by the first echelon. This echelon is prepared to protect the first echelon from a flank attack and to take over the mission of that echelon should it be-

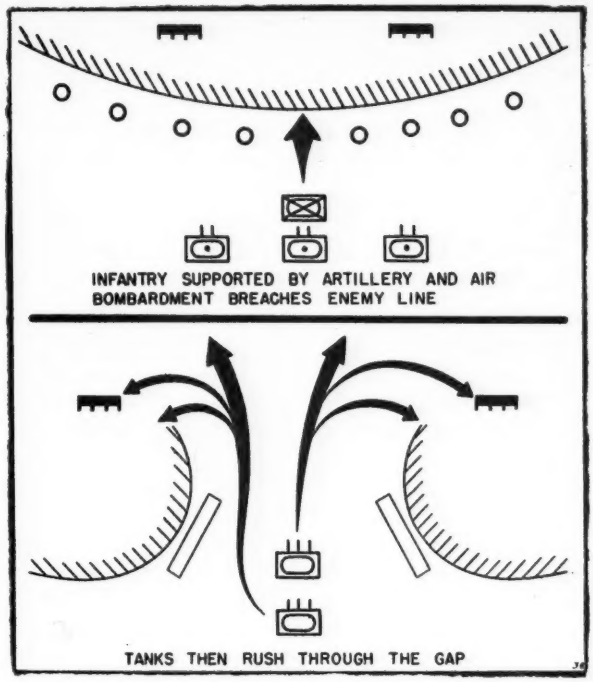


Figure 5.
PENETRATION, INFANTRY LEADING.

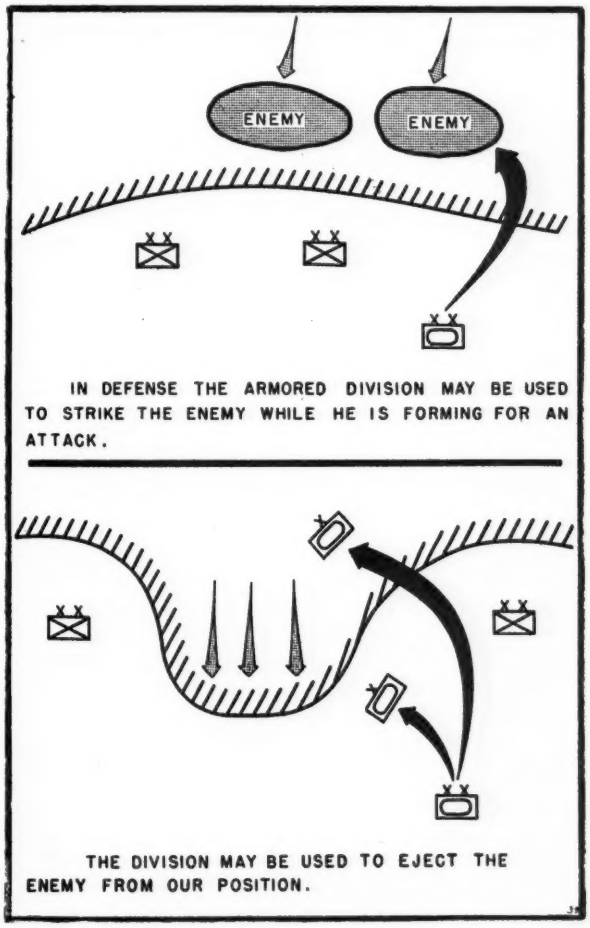


Figure 6.
USE OF THE ARMORED DIVISION ON DEFENSE AS PART OF A LARGER FORCE.

come so deployed as to be unable to continue effective action.

The third echelon of attack consists of infantry and tanks. It completes the enemy's destruction, seizes ground, and protects flanks and rear.

The armored infantry supported by artillery, air bombardment, and engineers may attack first to remove obstacles, such as mine fields, or seize ground from which the tanks may attack. After completion of this mission it is passed through by the first and second echelons of attack and joins the third echelon. (See Figure 2.)

The form of attack favored by armored units is the envelopment, either single or double. The infantry supported by tanks and artillery makes the frontal attack to fix the enemy while tank units supported by artillery and bombardment aviation envelop one or both flanks. Reconnaissance units may keep contact with the enemy's front while the entire combat command makes an envelopment. Again the entire infantry regiment may make a frontal attack while tank units attack from the flank. The particular combination to use will vary with the terrain, the enemy situation, and the mission. (See Figure 3.)

When hostile flanks are not open, a soft spot is sought and struck with a mass of tanks. Flanks created are rolled up and objectives in rear taken. (See Figures 4 and 5.)

In defense as part of a larger unit, the armored division is held intact as a reserve. It should not be divided into numerous small task forces but should be used as a highly mobile striking force to counterattack, either to eject an enemy who has succeeded in penetrating our position or to attack while the enemy is forming for an attack. It may be used, if the enemy has made faulty dispositions, for a wide counterattack deep into the enemy rear.

When acting alone on defense the armored division defends with its infantry occupying the main line of resistance and its tanks used as a mobile reserve.

In defense, the armored division may be used to strike the enemy while he is forming for an attack. (See Figure 6.)

The division may be used to eject the enemy from our position. (See Figure 6.)

What Really Is Air-Cooperation

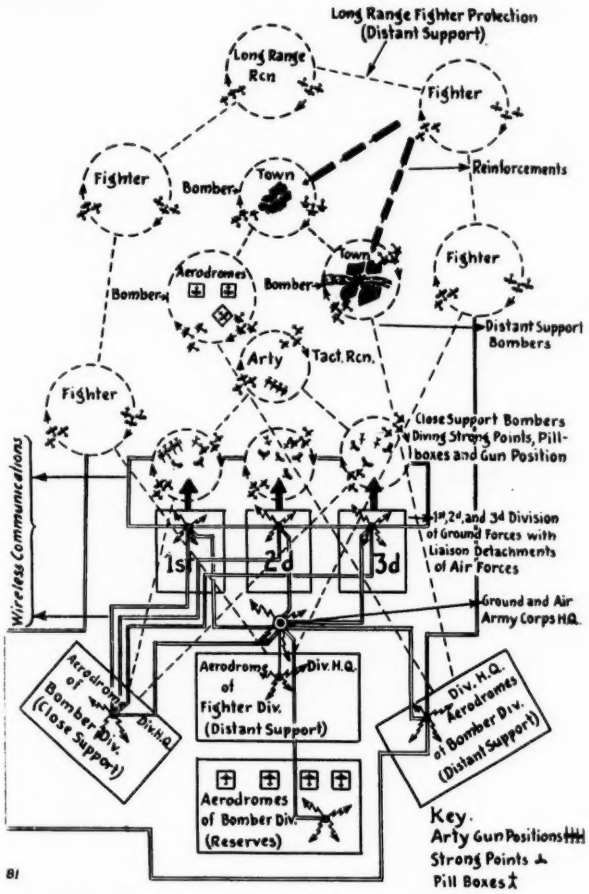
By
CAPTAIN F. O. MIKSCHE, *Czechoslovak Army*
(Author of *Attack*)

After the first world war the great impetus to the organizational development of air fleets was given by the Italian general, Douhet. In his own generation his influence was everywhere marked, and in Germany the Supreme Commander of the Air Force, Goering, was among his most enthusiastic followers. If we look at Douhet's ideas through the spectacles of the present and dig deeply into their true content we cannot but see that his forecasts belong to the future as he saw it and not the future as we see it now. He based his opinions on the experiences of the first World War without taking into proper account the future development of the ground forces of the army. "Fire power makes every maneuver on land impossible. But since the military decision in a combat is impossible without movement, therefore it will be the air arm which will take over the offensive role in modern war, leaving to the land arm the defense of the national territory." Douhet further believed that the modern air arm could itself force a decision. He did not see that it was only the means whereby with its support the land arm could force such a decision. Seversky's book, boasted up by propagandists, is really nothing else but a new edition of Douhet's ideas and thus represents a very extreme tendency: to underestimate any weapon is as dangerous as to over-estimate it.

In many countries right down to the present day people have been wedded to the Douhet idea to a greater or less extent. In Germany, however, it resulted in bitter disputes. Goering's conceptions lost ground more and more. Step by step his air fleets were absorbed by the army. He himself was left only with the title of "Field Marshal of the Luftwaffe," as a result of which today he holds the office of a control organ, the National Socialist German Worker's Party (N.S.D.A.P.), in the Luftwaffe and aircraft industry rather than the role of chief field officer of the air.

One of the first opponents of Goering was the former Commander in Chief, General Baron von Fritsch, who during the first world war served as General Staff Officer in the Flying Corps, and therefore was not lacking in experience. "The functions of the Supreme Commander of the Luftwaffe become more and more fictitious . . . the Luftwaffe does not constitute a separate formation, but comes directly under the army with which it constitutes a compact whole" said Fritsch; and Ludendorff in his *Total War* adds the following: "No general should

imagine that the bombarding of towns brings victory . . . war is a reality and no theory. Victory will be gained by armies assisted by the air arm." (1935).



THIS CHART SHOWS AN EXAMPLE OF GROUND AND AIR COOPERATION

In these years of development both Fritsch and Ludendorff contemplated an air fleet which was indeed under the High Command but nevertheless worked in two parts: the great operational air fleets which were to be the strategic striking arm in the air battle and the cooperating air forces which were to constitute a tactical unity with the ground forces. A new stage of development in the Luftwaffe ensued in the years 1936 to 1938. "The German air arm collected from Spain a very rich harvest of experience which profoundly influenced their future development" said the inspector of the German Luftwaffe, General Milch, in the *Essener National-zeitung* of 21. V. 1941. The three commanders of the Condor Legion, Generals Sperrle, Volkmann and Ritchofen, came back with new ideas. They had seen with their own eyes the enormous influence of the air arm on the land battle and recognized in it the most potent instrument for a war of movement: one of the two elements (the other being the armored vehicle) which could unfreeze the stationary battle fronts of 1914-1918. In the new reorganization the idea of a separate cooperating air force receded more and more into the background. There was now only one goal: to organize everything for the support of the army. In this sense Generals Sperrle and Kesselring cooperated in May 1940 with Army Group A of Field Marshal von Rundstedt at Sedan and again with Army Group B of Field Marshal von Bock in Holland and Belgium. But this did not hinder Sperrle from organizing in the winter months of 1940-1941 the drastic bombardment of Coventry and London with this same air fleet, as we in our persons felt it.*

In the tactical sphere, by reason of the air arm, the modern battle is no longer confined to a line or zone. *The air arm has added a third dimension, so that the battle now must be fought in a cubic space. Only a commander who can think and act three-dimensionally can succeed in this battle.* In strategic air battles as well as in tactical air fights the air force must depend entirely on itself. Irrespective of whether the task of an aircraft is defensive or offensive, it can act only in movement. This movement results in a constant swinging of air battles through vast air spaces. Another feature is the shortness of the air fight itself. Over the battlefield bombers become useless as soon as they have discharged their load of bombs. Fighter engagements last only a few minutes and their action is restricted further by their limited fighting range. Reconnaissance aircraft, however, are operating as long as they are actually in the air above the area of the battlefield. For these reasons the air battle consists of innumerable individual engagements. This must be emphasized because the tactical consequences of single air fights, though each by itself appears insignificant, may be of the utmost importance within the framework of a major operation. It is therefore only possible to understand the significance of single engagements when they are viewed as part of the total performance of a large air force unit, perhaps a division. The immediate bearing of this on the matter in hand is that the support air fleet involved in a land battle must be put into action in successive waves; and before their task is finished, the number of aircraft may be increased to thousands. Thus the number of aircraft put into the battle of Crete may be estimated at about 1,600. It is mathematically demonstrable that a support air fleet of 1,500 machines cannot maintain over the battle field more than about 150 machines, and

*What a bitter reflection it is for us today, after three years of war, to read from the pen of Flight-General Quade in the 1941 yearbook of the German Luftwaffe the following: "The enemy might have seen from the campaigns of the past the pregnant results of full cooperation between the army and the air force in a modern war. But he has not done so because he neither could nor would"; or again to read in the same publication another quotation from Colonel Claes, a specialist in signalling: "the aircraft of the enemy fly about over the field of battle, when they should be operating closely with the ground forces. Our opponents often have no idea where their air formations are located, and when they get information, it is already too late. Everywhere they arrive too late."

this does not take into account losses in air fighting or the repair of damaged aircraft.

It goes without saying that the high demands made on the air arm in a ground operation are only within the capacity of a support air fleet which in organization and tactical employment is most carefully coordinated with the ground forces. It must therefore be conceded that an air arm constructed purely for long-range bombing is hardly in a position to cooperate successfully in a major operation. The bombardment of towns such as Essen and Cologne (as also, in their turn, London and Coventry) requires from the air staff, flying personnel and signalling service, in respect to organization and training, other *desiderata* which are in principle simpler than those required in close cooperative action with ground forces. One might say, indeed, that for the latter type of work a higher grade of tactical handling is required; and if this be so, *it will be a difficult matter to advance from a lower to a higher function.* For, while a watchmaker (if he has the strength) can easily wield a sledge-hammer, it is impossible for a blacksmith to execute the delicate work of a watchmaker. Beyond this is the danger of "putting all our eggs in one basket"—of staking all our prospects of success on one chance: that the bombing of cities will prove decisive.

I may develop my central point in general terms thus:—The effective use of weapons in the battle is conditional upon their combination in a correct organization. This organization must pay regard above all things to the technical characteristics of the armament in question: this means to their influence on the battle itself and to the way in which the different parts of the total armament can, during the actual fighting, mutually supplement and complete each other. This is the basis of all true tactical handling. Consequently, the form of organization must be flexible enough to be adapted to the changing phases of the battle, now to attack and now to defense. The secret of an effective tactical "set-up" lies in the orderly combination of different weapon-capacities. An armored division comprises different types of tanks whose functions supplement and complete not only each other but the other arms as well, and the same principle applies to the organization of the air force. Only that air force which is composed of mixed units whose organizational structure runs parallel with that of the army is suited for cooperation with ground forces. Only so in the battle can the armament and other characteristics of different types of aircraft be exploited to the full, as between themselves and as between them and the ground forces. Hence my conclusion that an air force in which a sharp division is drawn between fighter and bomber commands can never lend to the ground forces that total dynamic support which is necessary to victory in a modern battle. Moreover such an organization is a hindrance to proper cooperation between the main component elements of the air force itself.

The successful conduct of the combined operation is contingent upon accurate timing and meticulous attention to detail and on the preliminary preparation. In view of the great speed of modern war machines on the ground and in the air, thought and execution are all but simultaneous. Information, decision and action have become units in time. Tactical and operational decisions have to be made frequently and quickly, often in a matter of minutes. Whoever is in command of a combined ground operation will need to be conversant both with ground and aerial warfare. He in turn must rely on the experts of the support air fleet as far as their own very specialized work goes, share with them the responsibility: that is, that the air force must be subordinated to the land force, the more as the faster elements in the air have to adapt themselves to the slower ones on land. Given all these qualities the performance of an operation will resemble that of an orchestra. The conductor is the commander of the ground forces, and all the instruments come in at the right moment and with the right strength so as to produce a real harmony.

True coordination is conditional upon a unified control which implies subordination. In this country (England—Ed.) the problem of coordination has been approached differently. The three branches of the fighting forces enjoy an apparently large measure of autonomy, and they stand in reciprocal relations which are better expressed by "association" than by "subordination." Sound logic fights shy of any such solution. Such forms of organization make it very difficult to demarcate clearly powers and responsibilities. This further may lead to unsound compromises between the different branches of the fighting forces which will have unfavorable repercussions during the operation. The battle itself presents the leadership with a great variety of situations which cannot all be foreseen in detail. Hence the necessity of a unified command which at the crucial moment will have at its disposal all branches of the fighting forces and handle them as the situation demands.

For the purposes of this article I have in mind the organization of an air army corps which typically may be taken to be composed thus:

I. Fighter Division.

One Fighter Group. Second Fighter Group.
One Reconnaissance Wing.

II. Bomber Division.

One Bomber Group. Second Bomber Group.
Third Bomber Group.
One Reconnaissance Wing.

III. Bomber Division.

One Bomber Group. Second Bomber Group.
Third Bomber Group.
One Reconnaissance Wing.

IV. Bomber Division.

One Bomber Group. Second Bomber Group.
Third Bomber Group.
One Reconnaissance Wing.
Group, 3 Wings. Wing, 36 Machines. (3 Squadrons).

Composition of Army Corps.

Fighters: 540 Bombers: 972
Reconnaissance Planes: 144
TOTAL: 1,656

In offensive operations the task of such an air army corps is the creation of a "Luftschwerpunkt" (air-thrust point) in the air space of the region where the ground operation takes place. But even the largest air support fleet will only be able to intervene successfully in the ground fighting if its units are systematically put into action at the right moment against the right targets in a highly concentrated strength. In discussing the tactical employment of such an air corps it is necessary to distinguish between its three main parts:

1. distant support air forces
2. close support air forces
3. reserve air forces

Let us suppose that the distant support air forces consist of one fighter and one bomber division. Normally it may happen that several land army corps are supported by one common distant support air fleet. But when the Army Air Corps has only to cooperate with one Land Army Air Corps put into action in the "focus" of the land battle, the 3rd (Bomber) Division would form the close support air force, and the 4th (Bomber) Division would be kept as a reserve to reinforce either the distant support or the close support forces in accordance with requirements as the action develops.

Deep thrusts cannot be launched successfully against the enemy's rear unless the attacker throughout the operation can rely fully on support from the air arm. If this condition is not fulfilled any initial advantage that they gain may be turned quickly into decisive failure. Hence: air supremacy is the key to the modern battle and must be gained not only to hamper or prevent enemy movements in the air but ground movements also, since these cannot be conducted successfully until mastery of the air has been achieved. *Air supremacy is gained either in the air by fighting or by destroying enemy aircraft on the ground and usually by a combination of both these methods. The fighter division of the distant support units tries to defeat the fighter defense of the enemy and thus create the conditions necessary for bombing of ground targets.*

The bomber division of the distant support air force in particular tries to gain supremacy by destroying enemy AA batteries and aircraft on the ground. It bombs aerodromes in order to pin down a large part of the enemy's air forces. The distant support bombers too turn their attention to ground force reserves and other important targets such as traffic installations, bridges, crossroads, railway stations, etc. In this way they try to disorganize the defensive measures of the enemy. All these actions tend to delay for as long as possible a clash between the attacker's and the defender's ground reserves or air forces and thus enable the former to execute his thrust easily.

In general the air force will act against two kinds of targets:

a. against targets located by air and ground reconnaissance or other reconnaissance services prior to the launching of the action.
b. against unforeseen targets: viz., those which are only discovered during the course of the action.

This is why long-range reconnaissance has the task of keeping a constant check on enemy movements, of drawing the attention of the distant support bombers to these movements or to the other targets and of warning their own ground forces of any special danger. It goes without saying that there must be a highly developed and well-timed cooperation between reconnaissance, bomber units and army units.

The distant support air forces, which I have discussed, influence indirectly the action of the army. Their movements must be directed by the air force staff stationed at one of the departure aerodromes (at the main base), but they must further establish contact with advanced report centers of the land army corps and divisions. In this way the activities of the distant support air forces will be coordinated not only with the main headquarters of the ground forces but also with the units of the close support air forces.

The second part of the air forces working with the army is the *close support* air forces. These cooperate directly with the troops on the ground and their action must form an intimate unity with that of the army. *The close support air force consists mainly of dive bomber* and reconnaissance units which intervene in the development of the ground fighting by bombing with HE or smoke bombs, machine-gun fire, etc.

The close support air force bombers for their part will further bomb both foreseen and unforeseen targets. By careful reconnaissance before the action, fortifications, gun positions, reserve positions at the landing head, etc., will be known in advance. But many of the targets will only appear during the combat itself, and to deal with these unforeseen targets it is necessary to have a number of bombers available over the operational area.

During the whole, combat troops will be accompanied by close support bombers which assist them in their fighting. To fulfill their tasks efficiently they must keep in constant touch with the ground forces by means of air force liaison detachments attached to the latter. They will then be able imme-

diately to pass on recent information gathered by air observation concerning the defender's position and his movements. Of course close support bombers, to avoid endangering their own troops, must observe a proper safety margin.

In contrast with the long-range reconnaissance of the distant support air forces that of the close support units is conducted mainly over the area of actual ground fighting. They will watch the enemy's activity as well as the fighting action of their own troops and will pass on all observations to the report centers of the ground forces. In this way they will help in the coordination of the individual efforts. They will inform the troops of details regarding the enemy's position and in addition maintain contact with ground forces which have lost touch with neighboring units or are fighting in complete isolation. In such cases they can establish communications between the fighting units and the brigade or divisional headquarters and thus replace or supplement technical communications (wireless) in cases where these are entirely lacking or not in full working order. The Germans use for this purpose special aircraft termed "report aircraft."

In principle, wireless communication between air and ground forces goes to division or brigade. Smaller tactical units such as battalions and companies maintain contact with their supporting air force units by ground strips and flash signals. When the ground strips are paid out in different patterns it is possible thus to transmit brief messages. Such messages will relate principally to the following:

a. the location of the different command posts.

b. information as to the situation as for example "we are surrounded," "we hold a line here," and so on.

c. request for news about the position of the enemy.

d. request for air support, while giving at the same time to the air forces the enemy's position.

e. request for munitions, food and such-like.

Summary news of a limited nature can also be given by light signals using different combinations of colors. Visual contact from aircraft to ground is, however, a more difficult matter. Here only colored rockets can be employed, but alternatively pilots may drop from the aircraft written instructions packed in small containers.

Obviously effective cooperation between air and land is only possible when the flying personnel thinks not only in terms of air fighting but also in terms of land force tactics. This demands a double training. Yet only so can the pilots put themselves in the position of the land force and thus draw from their air observation the conclusions necessary to correct and speedy action. And, vice versa, the soldier on land must understand fully the air arm so that he may know how and when the air arm can render its indispensable help.

To sum up: everything must work like clockwork. The movements of the flying units must be synchronized with those of the ground units as far down as battalion headquarters. This *inter alia* necessitates a finely adjusted signalling service, which must maintain communication with the air bases in order to organize contact between all ground forces concerned. This organization is entirely different from the one required for long-range bombing: that is, it needs a higher degree of flexibility. Only when these conditions are fulfilled does it become possible to exploit successfully on land a position prepared by the air force or to exploit in the air a situation developed by the forces on land. By complementary action of this type conducted according to plan, by going thus into action at the right moment in sufficient strength against the right objective, the two efforts, that of the air and that of the ground, will achieve their decisive effect.

There is no such thing as a good regiment and a bad regiment, but there is such a thing as a good colonel and a bad colonel.

—Napoleon.

It's Very Simple--But You Have to Have the Idea!

What does the German soldier do when he hits a swamp during the march?

"As one uses runners to travei over snow, so one must use a similar method for travelling through a swamp," said the inventive German Pioneers. With flexible sticks from the nearest bushes they fashioned a broad, flat shoe —and the "swamp-walker" was born.

Step by step they go over tough, sticky swampland. The "swamp-walker" keeps them from ever sinking down, and man by man they reach solid ground on the other side as ordered. The woven shoes are fastened like skis, except that the fastening is simplified by using wire. Straddle-legged, the pioneers conquer marshy terrain with the "swamp-walker."—From *Signal.*

If You Go to Fort Leavenworth—

The General Staff Course

The mission of the Command and General Staff School is to prepare selected officers of all components of the Army of the United States for command, general staff, and executive duties. The School serves the Ground and Air Forces, the Services of Supply, and, as directed, the defense commands and theaters of operations.

The opportunity to attend the Command and General Staff School therefore marks a turning point in your military career. It is a privilege not to be accepted lightly, as it may well shape your future in the military service.

The initial training objective is to ground all students in the general aspects of the United States at war and its military organization as correlated in the national war effort; the operation of field forces—ground and air—and the problems of supply and administration are depicted to the extent necessary to constitute a foundation for specific instruction. Current operations will be presented as a matter of general interest.

The ultimate training objective is attained by furnishing instruction in basic staff principles, specialized training in the work of each of the four general staff sections, and applicatory group work, depending upon the source or destination of each student, in exercises involving armored, motorized, airborne, or infantry divisions, or air force fighter, bomber, support and service commands, and antiaircraft defense, all as parts of task forces in combined operations.

The doctrines taught are based on the orders, training regulations, and manuals issued by the War Department. The influence of the development of new instruments of war is emphasized to the extent warranted by established facts.

The pace of the course is fast; instruction is necessarily concentrated. In nine weeks you will cover a lot of ground. However, you will find it not too difficult if you come prepared to apply yourself energetically.

The School makes no assumptions as to your military background; the course is complete. However, many students find it difficult to do their best work because they are struggling in a welter of unfamiliar terms, working with unfamiliar units, using unfamiliar tools.

If you want to do your best at Leavenworth, make certain that you won't be slowed down by unfamiliarity with your tools. For instance:

Learn to Read a Map.—Almost every problem at the School is based on a map. Until you are thoroughly familiar with reading a map, until you can glance at one and picture the terrain, the streams and the ridges, the roads and railroads, and the distances, you will be working under a handicap. It is not enough to be able to interpret conventional symbols one by one; the whole map must stand out as a complete picture of the ground. Many of the school problems are based on foreign maps. For instance, you will have problems in the tactical operation of troops of all arms, both ground and air, in locations not only in many parts of this country but in England, Ireland, France, Africa, and the S.W. Pacific.

Know the Conventional Military Symbols.—FM 21-30, *Conventional Signs, Military Symbols, and Abbrevations,* contains a list of the basic military symbols. They should be as familiar to you as the alphabet. In particular learn the method of designating various echelons (platoon, company, battalion, regiment, division, etc.) and the basic arms and services (infantry, engineers, cavalry, etc.). These are tools you will use constantly.

Know the Military Abbreviations.—Military abbreviations listed in FM 21-30 are specified for all field orders, and no other abbrevations are authorized. Learn to write the specified abbreviations accurately and with facility, so that your work will not be slowed by the mechanics of using them. In particular, learn the abbreviations for the various arms and services and the various echelons of command.

Make a Preliminary Study of Basic Texts.—Only approved War Department doctrine is taught at Leavenworth. This doctrine is set forth in the various field manuals. Familiarity with these texts will pay rich dividends during your stay at the Command and General Staff School. As a minimum you should review or study FM 100-5, *Field Service Regulations,* Chapters 1, 2, and 4, and preferably the first eight chapters. Again as a minimum, you should be familiar with the content of FM 101-5, *The Staff and Combat Orders,* to which you will have occasion to refer constantly throughout the course. Familiarity with the FM's in the 30 series is desirable.

Know the Principles of Organization.—Most units are similar in organization regardless of branch. A clear conception of the framework of organization is a necessity; the relative strength of companies, battalions, regiments, divisions, corps, and armies and their relation to each other must be thoroughly understood. Details of organization will be covered in the course, but a conception of the general nature of the various type units is necessary to intelligent absorption of other instruction.

You will find that the preliminary preparation suggested above will ease your burden as a student, and will enable you to devote your best thought to the solution of the problems presented, without getting bogged down by the mechanics.

So much for your mental tools. As to the physical tools, everything necessary may be procured at the Command and General Staff School Book Department except a study lamp, which should be brought by the student. You can save expense by bringing your own colored pencils, map measurers, scales, and notebooks. You will require exercise; so bring such athletic paraphernalia and appropriate clothing as you desire. A golf course is available during clement weather.

But above all, bring with you an alert mind and a desire to learn. If you come thus equipped, you will leave equipped for bigger jobs and greater responsibilities.

The Services of Supply Staff Course

Elsewhere in this issue of the Military Review there is an article explaining the purpose and extent of the Services of Supply Staff Course at the Command and General Staff School. For the prospective student assigned to the SOSS Course, this article should be profitable reading. It will give him a fairly complete estimate of the situation he will encounter when he comes to Leavenworth.

The mission of the Services of Supply Staff Course is the training of officers for duty on supply and administrative staffs of the Services of Supply, service commands, and for similar duties within the theaters of operation.

The subject matter of the course, as will be seen readily, is comprehensive and the presentation moves in high gear. During the initial weeks of the course, when organization is under scrutiny, the student must grasp and retain information on many separate and, at the time presented, unrelated subjects whose application will not become apparent until later.

Consequently, the student must strip his mental equipment of all unnecessary impedimenta and leave it free to absorb and keep in orderly accessibility all the principles which are being given to him for future use. Worries should not be brought along. Clear thinking heads the list of requirements for success in the SOSS Course.

Time and space factors are paramount considerations. There is a vast amount of work to be covered in nine weeks. Into that period is crowded a total of 370½ hours of conferences, exercises, map exercises and map maneuvers. Study assignments will require an average of three hours of work nightly. The student should come to Leavenworth determined to budget his time to obtain the maximum results from each minute spent in class or study.

On the side of physical fitness, the prospective student should assure himself in advance that he is able to "take it." If his eyes need attention, they should get it in advance. If glasses are indicated, they should be acquired. A spare pair is good insurance against accident. An adequate desk reading lamp should be procured and brought along. A green eyeshade is a big help. Foresight may save eyesight.

In order that prospective students may derive the most benefit from the course, it is suggested that familiarize themselves with the following as a minimum of fundamentals. In fact, no officer should attend this School without that much background:

FM 100-10 Field Service Regulations—Administration. Be familiar with its organization and where to look in it for pertinent material.

FM 100-5 Field Service Regulations—Operations. Review the fundamental doctrines of combat operations and the organization and characteristics of the various arms.

FM 101-5 Staff Officers Field Manual—The Staff. Get acquainted with the staff sections and their functions.

Service Command Staff Organization and Functions. Know what the staff divisions do and what means they use. A chart of your own Service Command headquarters will help.

FM 21-25 Elementary Map and Aerial Photo Reading. Be sure you know how to read a map and can interpret an aerial photo. Along with this study, familiarize yourself with basic military symbols. They are contained in *FM 21-30 Conventional Signs, Military Symbols and Abbreviations.* You will have constant need for this knowledge and this preparation should take high priority.

Thus armed and equipped—with a clear head, with a realization of the value of budgeted time, with his mind refreshed by review of the fundamentals of the subjects he faces and with the physical aids he requires—the student may approach his nine weeks' main effort in the SOSS Course without fear, and when it is all over, without reproach.

Scope of the Adjutant General's Department

By
MAJOR GENERAL JAMES A. ULIO, *United States Army*
The Adjutant General of the Army

The *mission* of the Adjutant General has been very little altered since the office was created by the Continental Congress in June, 1775. He is the Administrative Executive of the War Department charged with writing orders, keeping records, conducting correspondence and performing *such other tasks* as may be necessary to supervise the Army's administration.

But in the miscellaneous variety of those "other tasks," close resemblance fades between current activities and what must have been the comparatively untroubled existence of Horatio Gates, who first held the title. Long ago the Adjutant General became a multiple personality with a department called in his name. The Adjutant General's Office—known to every officer and enlisted man as "the AGO"—now supervises a vast number of operations, many undeveloped even as recently as the first World War.

Some of these are new activities, such as the Adjutant General's Schools. Some are extensions of already established functions such as the system of Classification, which dates from 1917 but has been greatly refined during the last two years to sort accurately the special skills required by modern war. Still other activities represent notable advances in efficiency such as the adoption of business machines to post the Army's records and tabulate its strength.

The extensive organization of the Army Postal Service, the increasing use of microfilm for conserving space devoted to records, the administration of the Allowance and Allotment Act, the round-the-clock operation of the Reproduction Branch—these are other duties undreamed of in Horatio Gates' philosophy. Their demands, almost as much as the simple multiplication of actions required by the increase of our Army from fewer than 200,000 to several million men in less than two years, have required a vast enlargement in the scope and volume of work which the Adjutant General's Office administers.

Because the very complexity of today's operations calls for the highest degree of efficiency, the whole structure of the AGO was recently restudied and revised. Although the details of this streamlining process are of little interest beyond the personnel of the department itself, their effects have already made themselves felt throughout the Army. There have even been hopeful whispers that we are bent on a vigorous reduction in army paper work and that in the future we shall provide fewer bundles of records to be tied up with the G.I. red tape which Adjutants General are accused of weaving into intricate puzzles for the Army to solve.

I can assure the Army solemnly that reduction is indeed the intent. I can go further and state that the fact will become increasingly apparent as succeeding reforms of method and functioning are put into effect. But I can also assure military personnel that no matter how much it may be simplified, administration will always seem arduous and occasionally needlessly complex without a clear understanding of its nature and purpose.

In the Army, administration is a function of command. It has two objectives. The primary one is success in battle; the secondary concerns matters not directly related to combat. Unity of command—and hence unity and uniformity in administration from the War Department to the squad, cannot be destroyed without risking the destruction of the army itself.

It is an utter misconception of the whole purpose of administration to consider it as synonymous with "paperwork," though traditional prejudice and lack of understanding frequently lead to this confusion. Actually, administration is executive and operative. It consists of business management, personnel management and management of records. So successful has the Army been, indeed, in establishing methods of command and administrative control that large industries have found it profitable to copy the Army system.

The primary functions of administrative officers are those of coordination and control. Those duties must be performed in all echelons if the Army is to operate efficiently. Adjutants General exercise no personnel command but, as business managers, act as administrative executives for the commander, performing functions which are vital to the military effort. Serving their commander, they are responsible for coordination, uniformity and efficiency in administration through the command channel from the War Department to the lowest echelon.

It must be apparent, therefore, that to study the work of this department which touches the Army so importantly and at so many points is a useful pursuit not only for Adjutants. All officers, whatever their duties, will find profit in discovering how the Adjutant General carries out his mission.

To begin with, there is the Adjutant General's Department and there is the Adjutant General's Office. The first is a branch of the Army. Officers assigned to this branch wear as insignia the red, white and blue shield. No enlisted men are assigned to the AGD.

The Adjutant General's Office is the operating center of the AGD within the War Department. Orders for the Army issue from the AGO by authority of the Secretary of War or the Chief of Staff and are certified as official by the Adjutant General. In the AGO are kept the central records and files of the Army, and from here the administrative business of the Army is directed. The office functions in a similar capacity for the separate administration of the Services of Supply.

Under its revised set-up, the work of the AGO is distributed among four principal divisions—Personnel, Operations and Training, Miscellaneous and Control—each composed of a number of branches which perform specific and limited operating functions. Outside this structure there are the Executive Officer, the Administrative Assistant and the separate Executive Branch, reporting directly to the Adjutant General. There is the Director of Records, whose duties I shall presently describe, and there is the Army Postal Service, which it was thought wise to set up as a separate entity without divisional status. Both of these also report directly to the Adjutant General.

Of these different divisions, branches and agencies, the Control Division is the newest and, in a very real sense so far as the rest of the Army is concerned, the most significant. To it is delegated responsibility for the operating efficiency of the AGO.

At the time of the reorganization of the War Department (WD Cir. 59, March 2, 1942), the Adjutant General's Office became a part of the Services of Supply. Shortly after the reorganization was announced, there was established in each of the services a Control Division with broad powers and the general mission of establishing and maintaining a high degree of operating efficiency. Informal contact throughout the SOS was authorized for these Control Divisions, to avoid the delay of channeling. In the Hedquarters, Services of Supply, a central Control Division was established.

The work of these Control Divisions is a continuing function, and its purpose is to make certain that no unnecessary operations become "frozen" and remain to plague the Army long after their usefulness is finished. Certain officers of the Control Division in the AGO are at all times on roving assignments. Their mission is to simplify forms and procedures in a realistic manner and to coordinate all such activities between AGO and other installations.

It should be emphasized that they are not "looking for trouble," though it is fair to describe them as "trouble-shooters." Their approach is one of constructive criticism. In fact, their example should induce a spirit of self-analysis in all branch chiefs, for the Control Division has little patience with operations which are carried on in a certain groove only because they have always been done that way. On the other hand, there is no desire to make changes in useful methods for the sake of change alone. Nor is speed of operation the single objective. The prime requirement of the Adjutant General's Office is accuracy. The Control Division attempts to establish methods which increase output as much as possible, consistent with accuracy.

Theirs is a staff function with no direct operational responsibility except as regards their own division. A clue to their method is that most of the liaison is conducted by telephone or personal interview. Memoranda are resorted to only when resistance to suggested change is so strong that it is felt wise to commit discussion and recommendations to paper. Where possible, revised procedures are installed as simply as this: The Director of the Control Division telephones his considered proposal to the appropriate authority—the chief of a branch or the director of another division in the Adjutant General's Office or to the control officer of another service. If no objection is encountered, the change is put into operation. When it has been accomplished, that fact is transmitted to the Director of the Control Division by telephone, and the incident is closed. Notes and informal memoranda prepared within the Control Division are destroyed. No correspondence need be filed, since the operational change has been accomplished entirely within the affected agency.

In the revised set-up of the AGO, the entire objective has been organization along functional lines with as much decentralization as possible. As much as possible, each branch is devoted to a single activity with specified limits, broken down, where necessary, into sections and sub-sections. The Personnel Division, for example, includes branches which provide all the vital statistics of individuals in the Army. But it does not touch their training, which is properly another field.

An examination of the Personnel Division will indicate the functional approach of the modern AGO. There is first of all, the matter of procurement, and so there is a Procurement Branch. Within it is the Recruiting and Induction Section, which administers recruiting, produces recruiting posters and literature (there is a vast printing plant on Governors Island, New York, which is operated twenty-four hours a day by the Recruiting Publicity Bureau), and considers other matters in connection with the procurement of voluntary enlistments for the Army and lately for the Women's Army Auxiliary Corps.

Within this branch also is a section to deal with officer procurement direct from civilian life. There is a vast need for men who possess various types of experience, and in 35 key industrial cities, offices have been set up under the jurisdiction of the Service Commands to consider men for these commissions. Although these offices are not operated directly by the Procurement Branch, applications and commissions are eventually processed in this branch and appointments made through it. Appointments to the United States Military Academy are also handled by Procurement.

There must be files for officers and enlisted men, as there have always been, where the details of their army lives are built up as progressive military biography. The two agencies which have always dealt with these matters are now assigned for greater functionalism to the Personnel Division as the Officers Branch and the Enlisted Branch. The Officers Branch is the operating agency on all matters relating to requisitioning, classification, allotments, promotion, assignment and reassignment, separation and records of individual officers, warrant officers, nurses and members of the Army Specialist Corps and the Women's Army Auxiliary Corps. The Enlisted Branch performs similar functions except classification and assignments for enlisted personnel. The "201 files" of both officers and enlisted men, formerly a responsibility of the Executive, have been transferred to these two branches.

This is war, and there will be casualties. Therefore, a Casualty Branch has been established to administer this status separately. A grateful nation, however, will not fail to recognize the valor of its heroes, and a separate Decorations and Awards Branch has been created to carry out this function.

Production of all the records of individuals, units, stations, posts—indeed, of the entire Army—is now charged to the Machine Records Branch, which is a proper part of the Personnel Division. This is a comparatively new development of the AGO, for it was hardly two years ago that the replacement of hand and typewritten records with business machines began. In the AGO the machines now are constantly clicking, twenty-four hours a day, recording and producing on call the vital statistics of the Army.

Young John Smith, who reported at a Reception Center this morning, will presently have two cards on file in the Machine Records Branch, coded with those cryptic punches which, when decoded, tell the army most of the facts about Pvt. John Smith. The first of these is his Enlistment Card, made out at the time of his enlistment or induction through Selective Service, which contains basic information—his name, serial number, place of birth, race, permanent address, next of kin, education and other data which will not alter by reason of anything which he does in the Army. This card will remain as the current record until it is replaced by a Separation Card at the time John Smith leaves the Army.

There is also John Smith's status card which always contains the latest information about him. It is made out when John Smith receives his first assignment to duty at a Replacement Training Center or Unit. At that time it shows where John Smith is (post, company, battalion, regiment, etc.); it shows that John Smith is on active duty and that (let us say) he is a "basic soldier" without special skill.

Presently, however, John Smith is assigned to a training course. He acquires a skill. Back to the Machine Records Branch in the AGO comes a Report of Change Card, recording this development in his army career. Hereafter, John Smith is to be considered by the Army as a man with special usefulness. So his old Status Card in the Machine Records Branch is replaced by a new one on which this fact has been added. Thereafter, every alteration in the status of John Smith will be sent to the Machine Records Branch on a Report of Change Card, so that he may be counted correctly in any tabulation of the Army.

For example, if John Smith breaks a leg and goes to the hospital for six weeks, he can no longer be counted on active duty in the strength figures. "Duty to hospital," says the Report of Change Card which carries this information, and the Machine Records Branch will show John Smith's hospitalization on his Status Card until another Report of Change arrives with "Hospital to duty." Incidentally, all of these Report of Change Cards, after their information has been coded, are sent to the Enlisted Branch, where they will become a permanent part of John Smith's military record in his 201 file.

Officers' records are kept similarly on punch cards. In the Machine Records Branch of the AGO there are three principal cards for each officer. His Statistical Card is similar to the enlisted man's Enlistment Card, and contains perma-

nent data only. His Qualification Card is a record of his experience and skills, both civilian and military, which will prove valuable when the Army is searching for special qualifications among its officer personnel. If, for example, an officer was wanted who could speak Polish, knew all about Diesel engines, was an expert photographer and had a degree in law, it would be a comparatively simple matter to find him by running Qualification Cards.

Each officer has his Status Card, too, almost exactly like the enlisted man's. It is processed in the same fashion from Report of Change Cards sent from the units to which he is assigned, and, after his status has been brought up to date in the Machine Records Branch, the Report of Change Cards are sent to the Officers Branch as records for his 201 file.

There are other cards in the Machine Records Branch which catalog useful information about individuals, and there are new forms under consideration. In addition, the Machine Records Branch receives from Unit Personnel Sections in the field a series of Strength Return Summary Cards, which show the number of officers, nurses, their distribution by component, and the number of individuals from other organizations temporarily attached. There is a similar Strength Return Summary Card for troops and there is another which shows strength by grade. All of these are used in creating the master reports which show in detail the strength of the Army. Each month a master sheet is run from cards of this sort which shows the strength and its location for the entire Army.

Before business machines were used, it required 45 days to prepare such a report, meaning that the Army's knowledge of its own strength was at best a month and a half behind. The machines prepare this same report in seven days. Once a month, the Army knows exactly how many men are under arms and their location throughout the United States as well as in the theaters of operations.

Of course, machine records must be created in the field as well as in the Adjutant General's Office in Washington. Personnel units at installations and at headquarters of the Service Commands are similarly equipped to turn out and maintain files of these cards, for each mans' record must be kept with his unit as well as in the AGO's central files. There are even mobile units, neatly fitted into trucks, which travel anywhere the Army may go. In the middle of a tropical jungle you may hear the unfamiliar clicking of one of these mobile units, capable of turning out the Status Cards of 100,000 troops in twenty-four hours.

Personnel attached to special Machine Records Units of the Adjutant General's Department are charged with full responsibility for maintaining these records and equipment. This means swifter processing of records under battle conditions. Also, it should be observed, it means a simplification of paper work in company, battalion and regimental headquarters.

Personnel Division has procured military personnel, inducted them and arranged to keep records of their individual and group military careers. Now the Operations and Training Division picks up the thread, to supervise training and administer important functions incident to the business of both the AGD and the AGO. The work of this division is divided into three Branches—Operations, Classification and Enlisted Replacement, and Training.

The Operations Branch carries on all the work not specifically charged to any other unit of the Adjutant General's Office. It maintains station lists, supervises fiscal affairs for the AGO, has custody of secret and confidential correspondence and files, issues general directives, adminsters the Army Extension Courses, runs the Travel Bureau. Much of this is routine, but it is highly important routine. On its smooth functioning depends much of the coordination of Army affairs.

Into this branch, also, comes all the miscellaneous correspondence with the public, which is an historic function of the Adjutant General. Twice, indeed, in his history, the Adjutant General has been renamed the Military Secretary, and very often in his recent history it has seemed that the public's desire to write letters to the War Department on every conceivable subject would threaten to engulf him. Many of these are useful inquiries. Often they are frivolous. But always they are interesting, as indicative of currents of thought which flow through the country. Every serious letter receives a responsive answer from the Adjutant General.

The Classification and Enlisted Replacement Branch administers the program of classifying enlisted men according to their aptitudes and skills. Most military personnel are familiar with the operation of this system and its vital necessity if the complex demands of modern war are to be filled. But those who see it in operation may not realize the vast amount of planning that was necessary before the Army developed its means of discovering that, say, John Smith, whose civilian experience appeared to point him toward no particular Army occupation, should do well in the Signal Corps.

There were tests to be created which would give unfailing clues to aptitudes. There was a Qualification Card to be developed—the large orange form which records the soldier's skills and aptitudes and which follows him throughout his army career. Instructors had to be trained in the new techniques, and these men, in turn, had to train interviewers in the science of classification. The business machines were called in, too, for the Qualification Card is coded for swift handling by mechanical means. The heart of the classification system is the ability not only to assign men shrewdly but to find them quickly when their skills are wanted.

Classification, it will be remembered, was used to some extent in the first World War when the Army Alpha and Beta tests provided a screen for sifting skills and aptitudes. But although classification was not dropped at the end of the war, very little further was done with it until May 1940, when it became apparent that the mechanized needs of modern warfare would call for classification tests far more efficient than any yet devised.

The suprpisingly accurate system which the Army now employs to determine the skills of its men was organized by functions within the Adjutant General's Department. The GHQ of this service is in the AGO. Here the tests are devised, procedures developed, directions issued. Constantly this branch of the Operations and Training Division is studying results, considering new tests, figuring out new methods whereby the principles of Classification may provide the Army with an even finer screening of the skills and aptitudes of its men.

The initial sorting of the Army's man power comes at the Induction Station where those physically or mentally unable to cope with any of some 645 army occupations are weeded out. Those passing this screen are next interviewed at Reception Centers where their occupational category is determined by a staff of enlisted men, trained in this work. Each inductee is taken individually. Small rooms are provided for privacy, and a 30-minute period is allotted for the interview. During this time a vast amount of information about the men has been entered on his Qualification Card, to be used as one of the bases for his assignment.

Incidentally, it is this card which precludes the possibility that a skilled man will be "lost" in the Army. Frequent demands for certain skills are met by running the Qualification Cards, which sort out the men desired. Although a man's potentialities might have been originally overlooked in his assignment due to a lack of demand for his special skill at that time, later needs are almost bound to catch up with him and result in his transfer. In addition, the acquisition of new skills in the Army often leads to reclassification. If, for example, a "basic soldier" becomes an expert automobile mechanic, that fact is added to his Qualification Card—and to his Status Card as well—so that all assignments will take this into consideration.

At the Reception Center, too, the General Classification Test is administered, to secure an index of aptitude in every new soldier. This test is one of the first experiences which the inductee undergoes. We have had time now to check its accuracy through comparison of the actual performance of soldiers with the scores they made when they entered the Army. It is interesting—and comforting—to know that the General Classification Test has completely justified its mission. Incidentally, those ingenious machines—for which the Army is finding increasingly varied use—are put to work in the General Classification Test to do the actual scoring. The test form is so designed that the indentation in the papers made by the pencil of the soldier creates a scoring basis.

This branch is charged with the assignment of men from Reception Center to Replacement Training Centers and units. It supervises the assignment of enlisted replacements from Replacement Training Centers to units and installations, and is responsible for maintaining the strength figures of all such units and installations receiving enlisted replacements. In other words, individual supervision does not end with classification or even reclassification. This branch keeps a finger on the men it assigns.

One important mission of the Training Branch is the supervision of the Adjutant General's School and of others operating under direction of the Adjutant General. There are now six of these. The parent school, since January 1942 has been located at Fort Washington, Maryland, an historic army post which had been abandoned in 1939 and was reclaimed from the Department of the Interior to house the first Adjutant General's School.

The school conducts four principal courses—in Administration, Classification, Machine Records, and Army Postal Service Administration. Originally the school was for officers only, temporarily assigned there from other branches of the Army and returned to their units at the completion of the course. Last January, however, an Officer Candidate Course was established to meet the growing need for specialists. The Adjutant General's School has become one of the very important adjuncts of the Department, not alone for the production and training of officers, but also as an operating laboratory for research and improvement of forms and procedure.

Late this summer additional officer candidate schools were established at Fargo, North Dakota; Grinnell College, Iowa; Starkeville, Mississippi; and Gainesville, Florida. Enlisted Men's Schools have recently been activated at Oxford, Mississippi, and Hattiesburg, Mississippi. In addition, the Training Branch maintains supervision over the Army Music School now conducted by the Army Band at Fort Meyer, Virginia.

Another function is planning programs and supervision of the work of special training units for enlisted men throughout the Army who are slow learners, illiterates or non-English speaking. The fact that this training salvages for full or limited service about 95% of the unfit sent to training units illustrates its value to the service at large.

The programs consist of academic instruction, careful physical training, and instruction in military subjects. A special section prepares teaching materials in reading, writing and arithmetic, including basic readers and film strips. It also conducts a teach-training program to aid the 650 enlisted men, warrant officers and officers who are conducting these classes throughout the Army. Testing materials have been prepared to classify the men according to their academic needs, measure their progress and determine their readiness for regular duties.

A Training Doctrine Section studies, analyzes and edits projected training materials including text-books and manuals; reviews training programs and schedules submitted by AG and AA School Commandants, studies local problems of schools and collates existing training principles and practices. It prepares teacher-training manuals, studies and determines proper teaching procedures and formulates time schedules for typical situations and requirements.

Into the Miscellaneous Division have gone five quite separate functions of the Adjutant General's Office, set up as distinct branches. Three of these need little discussion here. The Old Records Branch is charged with the Administration and maintenance of all military and semi-military records from the establishment of the Government to October 31, 1912. The Demobilization Records Branch administers records from November 1, 1912 of disbanded organizations and of individuals who have been discharged or separated from the service since that date. The Civilian Conservation Corps Branch is concerned at present with winding up the affairs of that organization.

The other two Branches require more extended treatment. There is, first, the Reproduction Branch, a new activity of the Adjutant General's Office. Reproduction units of the Services of Supply were started with a few duplicating machines to take care of the reproduction needs of the peace-time Army and as that Army grew to war-time proportions, equipment was added to carry the increased load. Production suffered from crowded conditions and separated operating units. Since each separate unit was unable properly and adequately to meet the increased demands of its own services, reproduction facilities of the Services of Supply are being centralized in one branch of the office of the Adjutant General. The assigned mission of this new Reproduction Branch is the rapid and accurate reproduction of directional matters and orders. Although the branch functions primarily for the Services of Supply (which includes the AGO, of course), it also produces material on request for other agencies.

Not infrequently, of course, this branch reproduces classified material. The Classified Section is a complete reproduction plant in itself. Only authorized personnel are permitted to enter. Only matter in sealed containers is received and all finished work is delivered under guard in sealed containers. Thus, military information is completely safeguarded.

The remaining branch of the Miscellaneous Division is the Publication Branch, with whose work everyone who has ever read a field manual is familiar. It is the agency through which War Department policies, instructions and orders are transmitted to the Army. In conjunction with the Government Printing Office it provides the Army with the technical, tactical, and administrative reference and textbooks without which it would be impossible to carry out the vast Army training program.

Like the Army itself, the Publications Branch has, within the past three years, expanded over and over again. From a small group of 38 Civil Service employees in 1939 the unit has been developed into an organization employing 660 men and women. Three years ago the branch occupied a few rooms in the Munitions Building in Washington. Today it utilizes almost half a million square feet of floor space with storage and supply depots strategically situated in four geographical centers of the country. Its distributing agencies are in every major port of embarkation.

During the past two years the Publications Branch has handled the publication of almost 550 technical manuals and 299 field manuals, varying in size from small pamphlets of 30 pages to volumes of 800 pages. In some instances, as in the case of FM 21-100, the Soldier's Handbook, single editions have run into millions of copies.

A very important new function of the AGO is handling the allotments and allowances in connection with Public Laws 625 and 490. The latter provides benefits for dependents of officers, enlisted men, warrant officers, nurses and civilian employees who are interned, missing in action or captured. The former is, of course, the Servicemen's Dependents Allowance Act of 1942, which permits enlisted personnel to allot a certain portion of their pay to relatives and provides additional

sums by which the Government supplements these allotments.

It is estimated that at least five million applications, plus several million change-of-status notices, will have to be processed by the Office of Dependency Benefits, which operates under direction of the Adjutant General and which is already running both day and night shifts. About 20,000 applications are now processed each day, and it is expected that at peak the personnel will be able to handle more than 10,000 applications in each eight-hour period.

But in spite of this enormous amount of detail, the office functions smoothly. Assembly-line technique receives applications at a message center, from which they go successively to Case Recording, Record Searching, Relationship Determination, Dependency Determination, Authorization, and thence to the payment section of the assembly line where checks are issued and mailed out. Sub-sections outside the assembly line handle other significant details.

While the needs of our augmented Army call for expansion everywhere, even under the rigid streamlining of more efficient operation, it may be comforting to know that in one direction, at least, it has been possible to contract. The War Department is both reducing and compressing its files. In 1941 a program was originated calling for the disposition of records which had become obselete. It also provided for the transfer of other files, rarely consulted, to microfilm at a vast saving of space.

On December 5, 1941, the office of Director of Records was established, and immediately the painstaking survey of army records began to take shape. It would be useless to cite chapter and verse on what has been done. But it is comforting to know, for example, that last year in one branch of the Adjutant General's Office approximately 3,000,000 pounds of nonessential records were disposed of, with the sanction of Congress, releasing more than 60,000 drawers of steel filing equipment.

Since January, 1942, lists have been published in War Department circulars of records judged disposable. Their custodians are authorized to get rid of them without formality. One office states that it has disposed of 83,000 pounds of papers occupying 2,475 cubic feet of space. No exact tabulation exists of the total saving, since reports on disposal are not required and the operation is a continuing one. But it may be safely assumed that the newly freed space is enormous.

The increased use of microfilm for the preservation of necessary records likewise means an enormous saving in space and equipment. By this time microfilm is fairly familiar. Essentially, it is simply the photographing, by special camera, of records on rolls of 8-mm. film. Libraries have resorted to this method for some years not only to save space, but to preserve records which were becoming brittle with age. To the War Department it means that thousands of feet of floor space and thousands of precious steel cabinets are made available for more current use.

In one case, two ordinary size file cabinets now hold the records which formerly occupied 4,000 square feet of floor space. In another, 100 tons of microfilm records released approximately 1,000 steel filing cabinets and salvaged about three tons of tinned metal file fasteners. This microfilming activity has only just begun and will be extended as fast as opportunity offers. It is an eminently practical system, and the records so preserved are as available for examination as they were in their original state. The rolls of films are called for by file number and taken to a small viewing booth where equipment magnifies the tiny type image to normal size.

Microfilm has also been used to great advantage by the Army Postal Service, for it is the basis of V-mail. The one great bottle-neck in the overseas mail operation is cargo space, both on planes and ships. Last June tremendous strides were made to overcome this block by the simple process of sending letters on film.

V-mail provides for overseas shipment of letters on rolls of film, each roll containing 1,500 letters. Special forms, available at all post offices and also in stationery stores, are used for writing the message. Equipment at ports of embarkation photographs these letters, and at their destination each one is developed separately on sensitized paper for individual dispatch to the addressee.

So great is the saving in cargo space effected by V-mail that 150,000 V-mail letters may be dispatched in a single V-mail sack which is about half the size of an ordinary mail sack. These same 150,000 letters, had they been written on ordinary paper and enclosed in ordinary envelops, would fill 37 full sacks of mail. This quantity of V-mail weighs only 45 pounds, while the same number of ordinary letters will weigh 2,575 pounds.

In addition to conserving urgently needed cargo space, V-mail has reduced the transit time of overseas mail by days and oftentimes weeks. An absolute priority is given V-mail by the War Department over all other classes of personal mail. Under this policy, Air Transport Command and cargo planes carry all V-mail waiting dispatch at the respective embarkation points where V-mail is microfilmed.

Incidentally, the Army Postal Service is also responsible for the Expeditionary Forces Message System, by which fixed text personal cables may be sent at nominal rate to overseas areas. The service is effected in cooperation with the commercial telegraph and cable companies, and these EFM cables mark the first time that such a service has been available to American overseas forces.

But V-mail and EFM cables are only a small part of the far-flung activities of the Army Postal Service, which is one of the operating agencies of the Adjutant General's Office. In peace time, the work of this service is limited in scope, consisting for the most part of long-range planning and providing proper postal facilities for the Army while on field maneuvers.

In war, however, the Army Postal Service immediately becomes a vital and necessary unit of the War Department, providing direct contact with military personnel wherever they may be stationed. This calls for officers and men experienced in postal problems, and so the Army Postal Service is staffed, for the most part, with men drawn from expert personnel in the Post Office department. Through the Postal Officer Candidate School, already noted as one of the functions of the Adjutant General's School, and by the selection of enlisted men with a Postal background, the Service is manned everywhere by qualified officers and enlisted men experienced in the operation of the mails.

In addition to the officers on duty with the Army Postal Service in the Adjutant General's Office in Washington, each Army, Army Corps, Army Division, and each post, camp or station with a personnel in excess of 5,000 has its own Army Postal Officer. Postal inspectors and technicians recommended by the Post Office Department are serving both in military and civilian capacity with troops in all overseas theaters of operation. There is now efficient mail service to every area where United States forces are stationed.

Only one other unit of the AGO remains to be mentioned—the Executive Branch. This acts as the coordinating agency for all contacts with the Adjutant General. It supervises the work of civilian personnel within the AGO, furnishes estimates of office supplies, furniture and equipment, supervises the handling of mail and central files, arranges space assignments of the Headquarters, Services of Supply, and operates the enlisted courier detachment assigned to the Adjutant General's Office. Its mission, in short, is to serve as the personal representative of the Adjutant General in those matters which directly concern the AGO as a business establishment.

Throughout this discussion of the organization of the AGO it has been apparent that decentralization was the guiding force. This motive had been extended even further during the past few months so that certain duties formerly assigned to the Adjutant General have

now been transferred to the Service Commands. These are functions which concern specifically military establishments located within their geographical boundaries and which the Service Commands can perform with closer supervision than the Adjutant General in Washington.

I think it is fair to assume that this policy of decentralization will continue and extend to every operation which may be usefully performed outside the AGO. I can assure the Army that the Adjutant General is not jealous of preserving any duty, now assigned to him, which can be carried out elsewhere with more efficiency and dispatch. The war operation is so huge that it should be the responsibility of every commander to reduce or streamline his functions and to maintain a constant scrutiny with this mission in mind. I feel that the AGO may take a certain amount of pride in its own accomplishment.

The Tank Destroyers and Their Use

By
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The tank destroyers are the grown-up antitank battalions formed in the fall of 1940. They have expanded many times in number and the armament has changed from towed to self-propelled weapons.

The use of armored forces in the early days of World War II proved that more maneuverability and greater fire was needed to combat them. To stop enemy tanks and other mechanized vehicles was the biggest job confronting our Army during the summer and fall of 1941. The problem had two aspects, the first of using what was immediately available, and secondly of developing weapons and antitank means to go beyond any foreign development. This meant that the organizations would develop as the ideas and weapons were tried out in the field and suggestions for improvements were received.

As a starting basis, an experimental battalion was selected. That battalion was equipped with various combinations of existing weapons and transportation. It was field tested in the Carolina maneuvers in 1941.

Thoughts were crystalizing on the needs for an offensive weapon and the organization to combat the armored attacks. The objective then was designated for the tank destroyer battalions. They were to have high mobility, great fire power and light armor. For protection in combat they must rely upon cover, concealment, rapid movement and skillful use of terrain to compensate for the lack of armor. To do this the fact was brought out that proper means were beyond the capabilities of any one arm and would require the use of a special force of combined arms capable of movement as fast as the tanks on any terrain and with the ability to intercept armored thrusts. They would be made lighter, faster and cheaper than the tanks. Our tank destroyer weapons are now being perfected so that the goal is being reached and the armored units successfully stopped.

ARMORED UNITS TACTICS

The enemy armored units will coordinate their actions with motorized infantry units and aviation to overrun and destroy any units encountered on the way to their objective. They will use every means at their disposal to conceal their attacking mass and the direction it will take in the attack. Once launched it will strike with surprise and speed while being protected on both flank and rear. Preceding this armored mass will be reconnaissance elements consisting of aviation, armored vehicles, motorcycles and reconnaissance vehicles, all seeking information to guide the direction of the armored attack. To smooth the way, combat engineers and motorized infantry will always be available to take out the mine fields and repair the demolitions. These reconnaissance elements may precede the main body by hours and many miles. They will endeavor to locate not only our dispositions but also dominating terrain, vital communications and supply installations. Special attention will be given to our antimechanized means such as mined areas, obstacles, antitank weapons, artillery and tank destroyer assembly areas. Having obtained the information, the tank attack is launched against weak spots. It will probably be preceded by combat aviation and artillery concentrations against located antitank, artillery and tank destroyer weapons. The information obtained may cause the enemy to lead with infantry and engineers in order to break through the barriers and make openings in the mine fields. After these have been surmounted by the armored mass, the armored security elements will protect the flanks and rear and prevent any counter-action or closing of the gap. At this point the tank destroyer units take up the fight.

TANK DESTROYER TACTICS

The employment of the tank destroyer battalions must be in accordance with the powers and limita-

tions of the matériel with which they are equipped. They are designed primarily for offensive action against armored forces and are capable of semi-independent action but preferably will operate in close cooperation with other friendly units. The necessity for that was very evident in the earliest self-propelled 37-mm mounts. Now the armament has been developed to the extent that their use is not so restricted.

What is a mission for a tank destroyer battalion? Any mission which requires offensive action against hostile armored forces is appropriate for tank destroyer battalions. Tank destroyer units are primarily intended for offensive operation against hostile armored units.

Tank destroyer battalions may also be employed to

a. canalize and stop an armored attack,

b. block envelopment or encirclement by hostile armored forces,

c. provide security against hostile armored action for friendly armored forces in any type of action or while in an assembly position.

Employment of the tank destroyer units as independent *defensive* elements and their distribution with a view to covering every possible avenue of tank approach or to afford immediate protection to all echelons of the forces leads to uncoordinated action and a dispersion of the means of antitank defense with subsequent loss of effectiveness.

Instead of yielding the initiative to the enemy, offensive action is desirable. Offensive action allows the entire strength of the unit to be employed against the enemy. Details of tactical employment of destroyer units will vary according to the matériel with which they are provided. Offensive action of destroyers equipped with the present matériel consists of movement to advantageous positions from which to attack tanks by fire.

The fire missions are direct fire from close range against point targets for short periods of time. Tank destroyer guns do not fire to harass or to interdict enemy targets. This type of mission is the job of the supporting artillery already in that zone of action. Movement is employed by the tank destroyers to bring fire to bear on the tanks at closer and more effective range. Surprise is a prerequisite to success in the destruction of tanks.

The tank destroyer guns secure surprise by the following means:

a. Careful movement by concealed routes into position and strict attention to camouflage to avoid detection before fire is opened.

b. Frequent lateral displacement to deceive the enemy as to the location from which the fire is being delivered.

c. Accurate fire placed at the proper time when the targets arrive in effective range.

d. Rapidity of fire until the tank is destroyed.

Only matériel which in every type of terrain has mobility equal, or superior, to that of tanks can advantageously act offensively throughout all stages of action. Matériel which has inferior battlefield mobility must compensate by superior observation, better use of cover, and a stable firing platform coupled with skillful maneuvers to engage the tanks. Only under exremely favorable conditions (generally open terrain with few obstacles to movement) does such matériel voluntarily engage in melees with hostile tanks. Occasional departure from this may achieve surprise, but habitual engagement in melees with tanks by matériel of inferior cross-country mobility is likely to prove disastrous. Employment should be by battalions in close coordination with other troops, particularly with infantry and aircraft. Infantry or reconnaissance company security elements are used to deal with hostile foot troops so as to allow the tank destroyers to attack tanks.

The employment of tank destroyer units must be included in the general plan of action for the entire force. When supporting a unit which is on the defensive, tank destroyer battalions are used to counterattack hostile armored forces. The defense of a position against an enemy force, including armored units comprises two main elements, viz:

a. Tactical localities organized and garrisoned for the defense of the main line of resistance including the organic antitank elements of the front line regiments (reinforced when necessary) and passive antitank means such as mines and obstacles.

b. Reserves of large units are held out for counterattack including motorized or foot infantry, armored units and tank destroyer units. When organized localities do not succeed in stopping the attack, these reserves disrupt, retard and canalize the attacking armored units and thus create conditions favorable for counterattack by intact reserves. Reserve units occupy positions in such a manner as to afford protection against hostile tanks, and to further disrupt and canalize the tanks into zones where they may be effectively dealt with by counterattacking forces. Destroyer units constitute the principal elements of these counterattacking forces.

In assigning a mission it must be remembered that tank destroyer battalions are not suited to close combat against strong forces of hostile infantry; they require reinforcement if such missions are assigned. Tank destroyer battalions operate in close cooperation with observation and combat aviation, either independently or with other units of ground forces. Maximum combat aviation support is particularly essential in fast moving situations where time for reconnaissance is limited. Destroyer commanders meet their responsibilities by intelligent anticipation, timely decisions and plans to meet all emergencies. Haste in execution cannot make up for time lost through lack of planning. The necessary preparations for combat include reconnais-

sance, formulation and issuance of orders; movement of troops into assembly areas or positions in readiness and arrangements for supply and communication, which are carried on concurrently as far as possible. Warning orders permit subordinates to make timely preparations. The results of reconnaissance, the size and location of the hostile armored force and the character of the terrain will determine the scheme of employment of tank destroyer units. The direction in which they are engaged must be based on a careful study of the ground. The terrain selected should afford ample maneuver room to permit full advantage to be taken of the inherent mobility of these vehicles.

Tank destroyer battalions are initially held back in concealed positions far enough to the rear to permit employment anywhere over a wide zone of action. From these positions they are moved up, preferably under cover of darkness, as the situation develops. Such movement may be for a distance of a few miles up to 40 or 50 miles to meet the armored thrust. When more than one likely avenue of tank approach exists, it may be necessary to hold a tank destroyer unit in a position of readiness in a forward area prepared to move rapidly to a threatened area. An advance in the presence of the enemy is conducted so as to avoid encountering the enemy while in unsuitable dispositions and in unfavorable terrain. An advance by bounds is effective. Early development is initiated in daylight movements whenever the road net permits. As the march progresses toward the enemy and attack by hostile aviation increases in intensity, cross country movement becomes necessary and advance is made on a broad front whenever terrain permits. Continuous reconnaissance far in front gives timely warning of the location of the tanks' approach.

The establishing of a warning net in each zone of action to cover any movement of enemy mechanization is imperative. The tank destroyer radios are tuned in this net as soon as they arrive in that area. This enables the tank destroyer commander to have plans always ready to meet the armored thrust wherever and whenever it is made.

Destroyer units attain surprise by concealment of the time and place of their action, screening of dispositions, rapidity of maneuver, deception and occasional adoption of unorthodox procedure. Tank destroyer units find and fix the enemy, hem in his forces and then launch a decisive attack to destroy them. Security elements of destroyer units precede gun elements in order to drive off or destroy any foot troops protecting hostile tanks. The action of friendly supporting infantry will be required if the hostile foot troops are in force. Deficiency in foot infantry cannot be compensated for by engagement of additional destroyer vehicles.

The most effective action of tank destroyer units against hostile tanks is to attack initially by fire from previously reconnoitered ambush positions prior to the deployment off the roads by the hostile armored force. After the hostile deployment, aggressive action by fire and movement will be normal.

It is most desirable to effect surprise attacks on tanks when they are in bivouac or assembly positions. This is best accomplished late in the day or in early morning, and will be performed by the tank destroyer personnel, who have received special training for this particular type of attack.

Action of destroyer units is characterized by mission tactics and decentralization, together with frequent alterations of original missions, or assignment of entirely new tasks. Despite the high degree of control permitted by abundant radio equipment of destroyer units, the rapid development of mechanized combat requires maximum initiative and resourcefulness on the part of all destroyer personnel. When the position occupied by destroyers is bypassed by hostile tanks, and no target is visible in the area originally assigned, destroyers move to seek out and destroy tanks which have passed them. Necessity for instant action will usually preclude the obtaining of permission for such movement; loss of touch with immediate superiors is promptly remedied. The extent of such movements varies with the terrain and the size of the unit concerned. Platoon leaders may move their units several hundred yards on their own initiative, squad leaders normally make only short moves to supplementary positions without orders from their superiors. In the absence of other orders, companies, platoons and sections which are sent into areas where tanks do not appear, will assist adjacent units which are engaged, or seek tanks reported in nearby areas. In such cases they leave a minimum force to accomplish the original mission. Changes in position as indicated are promptly reported.

The frontage covered or the size of the area assigned destroyer units for operation depends on many considerations including the strength and mission of units, the terrain, the enemy to be encountered and the support of other troops. Large areas of operation, assigned through necessity, are covered by holding a unit under control in a central location or by leaving gaps between subordinate elements. Mobility of destroyers allows them to shift rapidly from one position to another, except against a powerful force developed over a broad front. A destroyer unit can operate effectively in an area considerably larger than that which it actually occupies.

Emplacement of self-propelled mounts in a static defense is sometimes necessitated by the situation. This is not the type of combat for which tank destroyers are intended and as soon as practicable, destroyers in static defense positions are relieved by towed guns.

In conclusion, the action of the tank destroyer battalion is based upon a mission type order, and they are committed at the proper time by the tank destroyer battalion commander; but for execution, reliance must be made on the initiative, aggressiveness, resourcefulness, and fighting spirit of the subordinate leaders. They must act on the situation existing in the area where they are fighting. They must be determined to hunt tanks and to destroy them whenever found.

The Services of Supply Staff Course

By
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During World War I, some ribald wag with a flair for odious comparisons, composed a martial ditty, the theme of which was: "Mother, Mother, take down that service flag, your son's in the SOS!" Whether the chant represented an opinion universally held by rank and file is a moot question. However, it must be remembered that in 1917, there was little or no appreciation of the vast supply job at hand, and no conception of the importance of the Services of Supply in the picture. There were no Corps Areas, no Service Commands, but there were a number of supply services, each one competing for the resources of the country, in order to get a job done. Neither the War Department, the Services, the Government, nor the country at large was prepared for the vast supply job at hand. Yet, on the day the Armistice was signed, the ratio of SOS men behind the man behind the gun stood at 7 to 1.

Today, the entire world is supply conscious. The Services of Supply is acknowledged to be in the fight as much as anybody else. Frequently, supply troops must precede combat units overseas to pave the way. They are subject to attacks by air and mechanized forces. Occasions have arisen when there has been as much fighting and action in the rear installations as in the front lines. The SOS has come into its rightful heritage.

But in the present war, as our rapid expansion began to take form, virtually all of our experienced officers were dispersed to field forces and installations throughout the world. Service Command organizations and major supply installations were seriously affected. It became apparent that instruction and training would have to be introduced to produce staff officers for such jobs.

To meet this need, under the leadership of Major General Karl Truesdell, the Commandant of the Command and General Staff School, a Services of Supply Staff Course was started on July 11, 1942 at Fort Leavenworth—a course which had no parallel in the history of the Army.

Already graduates of the First and Second SOSS Classes are filling important jobs in several continents. Many have found themselves overseas as quickly as officers of tactical units. The demand for graduates of the SOSS Course for staff jobs outside the United States has increased by leaps and bounds.

The SOSS Course operates for nine weeks concurrently with the General Staff Course, and its mission is to train selected officers for duty on the staffs of Service Commands, Zone of Interior and Communications Zone installations. The curriculum emphasizes the organization and functions of the Services of Supply, the operation of civilian agencies engaged in the war effort and the supply system of the Army, but it also includes common and basic subjects which should be known to all staff officers.

Consisting of approximately 365 hours of work, the SOS Staff Course is set up for instructional purposes into five divisions—operating, personnel, intelligence and public relations, transportation, and supply. Conferences occupy 101 hours and applicatory exercises 264 hours.

Some of the general and basic subjects are taught jointly with the General Staff Course. These include:

Organization of the Army, the ground forces, air forces and Services of Supply, and their functions.

Organization and characteristics of infantry, motorized, armored and cavalry divisions and their capabilities and limitations.

Duties and functions of division staff officers including instruction in keeping staff records and reports, map and aerial photo reading, maintenance of situation maps, use of orders and operations maps, evaluation and dissemination of military information, counter-intelligence methods and relations with the civil government.

Planning and execution of offensive and defensive operations, with staff cooperation and coordi-

nation, in river crossings, desert operations, overseas task forces, defense against air, antimechanized combat and coastal frontier defense.

Movement of troops by rail, motor and air, with preparation of march tables and graphs and traffic control plans and problems. Included are instruction in motor maintenance and combat recovery, and exercises in formation of plans for training and administration in motor maintenance.

Planning for and direction of training.

The SOS Staff Class attends conferences which consider the current world situation, and exercises which study the organization and characteristics of German and Japanese Divisions, and methods of psychological warfare, jungle, desert, mountain and night operations.

In its own field of specialization, the SOS Staff Course stresses the organization and function of the principal SOS installations and governmental agencies, supply, transportation, personnel, internal security and public relations. Conferences and exercises given only to the SOS Staff Class focus attention on the national organization for war, and the missions and relationships to the Army of federal and state departments, boards, commissions and independent agencies particularly in matters of supply, personnel and internal security. The application of principles of industrial organization and management to the military establishment is also considered.

Detailed study is given to all the Services of the Army. Conferences treat of the organization of the Supply Services, the Administrative Services, the Control Officer Group, the Service Command and the Service Command Units at posts, camps and stations. Emphasis, likewise, is placed on matters of supply including planning, utilization and exploitation of resources, raw materials, conservation, recovery and salvage. Procurement and distribution are considered under the topics of priorities, organization and operation of depots, classification, distribution and issue, dehydration and refrigeration, and storage, including certain aspects of the problems of Air Force supply.

Transportation subjects range from the Office of Defense Transportation to operation of regulating stations in the Zone of Interior and the Communications Zone, with attention being directed enroute to the transportation situation in the United States, transportation facilities in our territories and selected foreign nations, control of freight and personnel movements, ocean shipping, ports of embarkation and debarkation, and the Maritime Commission.

Conferences and applicatory exercises deal with internal security plans and operations in disasters, disorders and subversive situations. Evacuation of civilians and prisoners of war, and the War Relocation Authority are included. Matters of construction, real estate and utilities, and relationships of SOS installations with division, district and post engineers are covered.

Full consideration is given to subjects concerning personnel, with problems of selective service and induction being coupled with a visit to the Fort Leavenworth Reception Center, and stress being applied to assignment and classification, replacements, morale, procurement of officers and civilian personnel and civilian personnel management and administration. The Women's Army Auxiliary Corps, the War time labor situation, and the War Manpower Commission are included. The Army Postal Service also receives consideration.

Numerous opportunities are afforded in the curriculum for the practical application, by the students, of the principles presented to them in conferences and exercises. Among others are exercises in the preparation of a general supply plan for an expeditionary force, a map maneuver in which a port of embarkation and elements of Communications Zone and an Air Service Command are played and a combined tactical ride and map exercise involving preparation of plans for internal security, disaster relief and counter fifth column measures.

The specialized work of the course is presented in a building prepared especially for the SOS Staff Classes. A century-old, block-long building, Stotsenburg Hall, south of the Command and General Staff School's academic building has been modernized and remodeled to contain the SOS Staff Course Students' assembly rooms, faculty members' offices, and a large lecture hall. The building was named long since in honor of Captain John Stotsenburg, 6th Cavalry, class of 1897, Infantry and Cavalry School, who was killed in action April 23, 1899 at Quinqua, Luzon, Philippine Islands.

Like the storied little red schoolhouse on the hill, which ably played its role in the nation's history, Stotsenburg Hall, and the facilities it houses, may be destined to occupy an increasingly important part of the Army's educational picture as the expanding war program requires more and more officers efficiently trained for duty in Services of Supply specialized fields.

The Officer and His Men

ISSUED BY
THE CURRAGH COMMAND, HEADQUARTERS STAFF, EIRE
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The first responsibility of the officer is not merely to train and to lead his men, but to know them.

The object of all training is to turn a man into a soldier. The observations that follow on the subject of the "care of men" are not offered out of particular solicitude for the man's soul, feet or stomach; nor are they presented with the vague intention of "helping an officer with his work." They are written solely and specifically to enable an officer to see that his men are fit and competent to play their part on a modern battlefield. There is here no question of "pampering the soldier." For the officer the only question at issue is "How do I insure that my men shall give of their best in battle?" No officer can afford to overlook the stark fact that at the end of all training is the battlefield. The final test of his work is only to be discovered on the battlefield.

Care of Men

"Care of Men" is a necessary foundation of all successful training. The man who is discontented and unwilling to learn takes longer to train, and can never reach a satisfactory standard of training.

A reasonable degree of receptivity on the part of the pupil is indispensable to every instructor. This receptivity on the part of the man must be largely influenced by the personal factors affecting his private life. These personal factors thus become of basic importance in his military career; and an officer's responsibility begins at this foundational point. At no hour of the day or night is he absolved from this responsibility; the Army does not put up the shutters or close the office door at half-past five. In civil life a manager or foreman is responsible for his staff or his "gang" for some seven or eight hours of the day. The officer is responsible for his men for twenty-four hours each and every day.

Two thousand five hundred years ago one of the great commanders of history told his junior officers that their first duty was to see that their men were "happy"; the rest would follow. The soldier of today may have been invested with weapons the ancients never knew; but he remains a man—and not merely an automaton rigged out in battle dress.

Mental Background

The first responsibility of the officer is not merely to train and to lead his men, *but to know them.* Although he may know every training manual by heart, if he cannot claim to know his men he fails as an officer. He must elucidate for himself their mental background. He must find out what they are thinking and what are their worries. The officer who visits his men at meal times and calls out "any complaints?" is merely asking for the almost inevitable response—a response as meaningless and automatic as the question itself.

An officer who is really doing his job will see for himself and check up. Men will show a queer loyalty even to an unsatisfactory officer; they will rarely complain over his head to a senior officer. The intelligent officer will ask, "Are the dinners good today?—Are the potatoes better than they were yesterday?" and ring the obvious variations. If he puts parrot questions, he must expect parrot answers.

If a complaint should be forthcoming on any topic whatsoever, he should never regard it as frivolous—unless it happens to be nothing more than good-humored grousing. No complaint can be entirely frivolous if it is put forward in all seriousness. If there is nothing in the complaint itself, the indication is that the man's mental background is at fault—and this is his officer's responsibility. It is perfectly well realized that an officer can only hope to penetrate this mental background through imaginative sympathy and an understanding of human nature and that these qualities of the mind cannot be acquired as a result of some external injunction. Nevertheless, they are likely to be developed unconsciously if the officer continually addresses his mind to the simple question, "What little thing more can I do for my men?"

There is no surer way for an officer to get to know his men than to take part in their games and to assist in their organization. His platoon or his company, instead of taking on the complexion of a solid wad of raw humanity, will become a collection of individuals, a knowledge of whose character will stand him in good stead under the supreme test of battle. It may further be noted that one unquestioned lesson of war is that regular healthy recreation for all men in camp and, when possible, in the field is as essential a part of the soldier's profession as his routine training.

The Officer's Military Background

The complement to the man's "mental background" must be the officer's military background. It is a quality of the mind he can never hope to acquire until he stops thinking of himself as a civilian. Both on and off duty he must remember that the uniform he wears indicates an assumption of responsibility far in excess of his former civilian responsibilities —whatever their nature. In war he is responsible not only for the welfare but for the lives of his men. He must get to "know the Army" and to think in terms of the Army.

To "know the Army" is a condition of spiritual awareness of a great comradeship that can only come as a result of intimacy and experience, but to "think in terms of the Army" is largely a matter of taking thought. In civilian life in an industrialized country the civilian is asked to do less and less thinking for himself; he is rarely flung back on his own qualities and initiative and resourcefulness; the convenience and luxuries of life are "laid on"; one turns a tap or puts the money on the counter. Life in the Army, under active service conditions, represents something in the nature of a reversion to a past age. The individual is largely thrown back upon his own resources; and although these resources may be forthcoming from the administrative services, it is still the responsibility of the individual to see that they are used to the best advantage.

The rations may be the same along the length of the line, but *the dinners will vary according to the trouble that has been taken over them;* and the wise officer will recollect that, in war, a hot meal before going into action represents a reinforcement of morale out of all proportion to the trouble and ingenuity its preparation demands.

In civilian life the art of improvisation is rarely imposed on the individual; in the Army the officer must regard it as a matter of course.

If his men are wet through and the billets destitute of any form of heating and if there is coal or wood anywhere within transportable distance, he will not settle down to his own dinner until the men's clothes are being dried and the billets warmed; nor, if their stay in them is to be prolonged, will he be satisfied with these billets until he has contrived to introduce as many small comforts as possible.

The art of improvisation needs to be exercised to the full under really difficult conditions; and in these days of air warfare, when communications and supplies are likely to be interrupted to a degree never experienced in the last war, the officer can never be certain that he will not suddenly be thrown back upon his own resources of ingenuity and determination.

It will be apparent from these observations that an officer who moves about his work with this military background to his day by day activities is asked to assume a habit of thought that must become second nature to him.

Cooperation With Civilians

When an officer is called upon to improvise the essential comforts of life for his men, he will almost certainly find it necessary to secure civilian cooperation. He need not doubt that this civilian cooperation will be readily available if he shows tact and consideration in his requests.

He must not wait for his men to show the necessary initiative. It is unquestionable that the average soldier displays a curious diffidence about approaching local inhabitants for such assistance as they might easily render. His uniform puts him in a race apart from the general run of civilian life, and if he belongs to some isolated detachment he will sometimes prefer to go without some small thing rather than knock at some civilian door.

The officer must intervene on his behalf. An officer's uniform should not be necessary to secure such obvious amenities for his troops, but the fact remains that it works like a charm, and the officer should not hesitate to exercise it on behalf of his men.

In all such dealings with local inhabitants the officer must remember that his own attitude, and the behavior of his troops, will directly influence the reception accorded his successors. This warning has special reference to the condition in which the houses are left. It should be a point of honor and decency to leave them clean.

Finally, when times are bad and it is beyond the powers of improvisation of any officer to relieve them—if, for example, a detachment is stranded during a move through some vagary of the weather—it must be understood that the officer sticks it out with his men.

Health of Troops

If his men keep going sick *it is the duty of the officer to find out why.* More often than not a man who goes sick represents a bad mark against his own administration. If there appears to be something fundamentally wrong with a man's health he should see that the M. O. (Medical Officer) takes appropriate action. A persistently sick man is merely a drag on the work of the battalion and a waste of his instructors' time. Even in an age of motorized and mechanized warfare a soldier must be prepared to use his feet; he must have teeth that will stand up to hard fare, and a body proof against hardship and spells of privation. If his men fail to take the strain, the trouble will have dated back to a period when the officer failed to look to the future.

On the other hand, if the officer watches the men's feet, the water they drink, the food they eat, the clothes they wear, and if there are any little luxuries to be obtained within 50 miles of the Battalion Headquarters, the Quartermaster chases after them, the men of the Battalion will never let the officers down. They will go into action in the spirit of "We have the finest lot of officers in the world and nothing is going to stop us."

Brains On the Job

If a man is fit and contented, an officer should have little difficulty with the problems of training; but behind all the regular routine of training he should remember that he has the general duty of seeing that his men bring their brains to bear on the work to which he put them. It is not enough that they should not be bored—and the first yawn should be regarded by the officer as a devastating criticism of his powers of exposition. He must train them to use their eyes by constantly questioning them on any points of detail with which they should have become acquainted during the exercises; he must crack down on those who dawdle on a skyline; he must deliver fearful warnings to those who meander across an imaginary battleground. He will do well to remember that in the last war the constant cry of "Get down, get down!" was in itself an indictment of the officers who uttered it; and if any of his men show a reluctance to move on their bellies during training he should make them realize that their chances of survival on a modern battlefield will be so slight that their presence will merely serve to encumber the work of the medical and burial service.

He should also remind himself that in this war every soldier is likely to be called upon to acquire something of the deftness and the adaptability of a night bird, and that a townsman will find himself at a serious disadvantage if his training is not modified accordingly.

An officer should insure that his men are given all possible information to take an intelligent interest in the general situation—whether on an imaginary battlefield or under actual war conditions.

The man who, in war, is utterly taken by surprise and rendered incapable of instant action is subject to the worst of all fears—fear of the unknown. A man who recognizes a bomb attack before the bomb bursts has already half mastered the situation.

Thus it may be said that it is an officer's responsibility during training not merely to fit his men for their work on the battlefield but to insure that they shall stand a chance of survival, and live to fight another day. In the average battle with imperfectly trained troops only a small proportion of the casualties can be directly credited to the enemy.

Discipline and Punishments

"Care of men" must not be confused with loving kindness. The officer must discover for himself the border line between considerate treatment and iron discipline. Without discipline a collection of individuals remains nothing more than a collection of individuals and useless in war as a fighting weapon. No man can succeed as an officer unless his men jump to his least word of command. It must be admitted that such power of command is largely a matter of personality. Nevertheless, any officer who endeavors to put into practice the precepts contained in the foregoing paragraphs will have established between himself and his men a subtle bond that will hold even under the strain of battle; he will be able to count upon them to respond to his will.

Will power is a quality of the mind that an officer can cultivate only by a stern resolve to do his job and to keep his head in an emergency, but the test will be immeasurably less severe if he is conscious that his men are all out to help him.

It should be further noted that discipline which depends for its maintenance on punishments is not discipline—that is, the training of the mental, moral and physical powers by instruction and exercise—but a cowed state of submission in authority. Such "discipline" will assuredly crack under the test of battle. The first-rate officer will have but little recourse to punishments. The cause of any punishment must inevitably be a symptom of something wrong in the body of troops under his command; and if he is ceaselessly investigating the men's "mental background," no symptom is likely to take him unawares. In particular the first-rate officer will avoid petty punishments. If he has to punish, he should punish hard—after fair warning. He should himself conform to the high standard of discipline he sets his men. When he returns a salute he should use his hand and not his stick, and if he has a cigarette in his mouth he should first remove it.

Morale

Every point of conduct discussed in the preceding paragraphs is ultimately directed to the question of morale. Good morale is the first of the soldierly qualities—as it has always proved to be the final arbitrament in war.

To the extent that the points discussed can be reduced to a simple everyday routine on the part of the officer and the constant and patient exercise of quite ordinary virtues, morale can be instilled into fighting troops; and any officer whose work helps to sustain morale makes a direct contribution to fighting efficiency.

Alternatively, any lack or failure of morale is equally his responsibility. The essential characteristics of the Irish race have suffered neither diminution nor change during the past twenty years; and every officer may take it that, if things go wrong, whether it be a platoon or in some high formation, the fault is with the officers of that platoon or formation, and not with the men.

The officer has all the advantages of education and environment; even in the heart of a campaign he is enabled to enjoy more than a few of the amenities of civilized life; by comparison, the private soldier has to rough it and just stick it out, whatever the minor amenities his officers have been able to secure for him. The officer who is worthy of his rank will never blame his men for any deficiencies in his command.

Finally, it may be observed that local inadequacy of equipment provides no excuse for any failure to implement the advice urgently offered in these paragraphs to those junior officers who today find themselves immediately responsible for the well-being, the training, and the fortunes in war of the Army.

Extrication from Combat: Retreat

BY
MAJOR GENERAL ERWIN ROMMEL, *German Army*

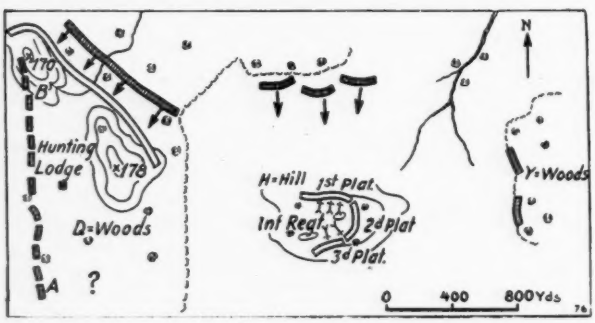
The following article comprises Problem 17 of General Rommel's book Aufgaben für Zug und Kompanie *published in Berlin in 1940. The book is concerned with planning and direction of combat problems, firing in action and map maneuvers; and the object of this particular exercise is extrication from combat, retreat.—THE EDITOR.*

Troop units.—1 rifle company, 1 heavy machine-gun platoon, 1 antitank gun, 1 group of messenger dogs.

Situation.—(Given out on *Hill H:* see Sketch) A Blue attack from the west against an enemy defending himself on the line *A-B* has had little success up to the afternoon of 12 June after many efforts. The casualties are heavy.

The 1st Company of the 1st Infantry Regiment, reinforced by 1 machine-gun platoon and 1 antitank gun, which has penetrated about 2000 yards into the enemy's defensive zone, is in an extremely difficult position by 7 PM. See Sketch!

The 1st platoon, 1 heavy machine-gun section and the antitank gun are engaged in very heavy defensive combat against strong enemy infantry with tanks, who are attacking from the north and whose forward elements have already approached within 400 yards. The enemy troops opposite the 2d platoon are holding *Y Wood* and have hitherto confined themselves to a very active fire. The enemy 600 yards distant in front of the 3d platoon which is also accompanied by the 2d heavy machine-gun section, does not make himself very conspicuous.



The adjacent units on the right and left are separated from the 3d platoon by a gap. They were still in touch with one another an hour before in *D Wood.*

The open terrain between the company and *D Wood* is being swept by the fire of the enemy machine gun farther north.

At 6:30 PM, the company commander had reported the capture of *Hill H* to the battalion and had urgently requested support from the other elements of the latter as well as a supply of ammunition and material for use in close combat.

The following written order from the battalion has just been delivered by a messenger dog:

> Battalion Command Post, Hunting Lodge,
> *D Wood*
> 6:50 PM, 12 June
>
> To the reinforced 1st Company:
>
> The 1st Battalion is holding *Hills 178* and *170* in *D Wood* against strong enemy counterattacks from the north and northeast. It cannot be supported by the 1st Company at present. The company will withdraw to the southern slope of *Hill 178.*
>
> "X."

The company hears a *loud noise of battle* (shell and mine explosions, continuous machine-gun fire) coming from a northwesterly direction.

Many enemy planes are circling about *in the air.* Our own aviators cannot be seen at the time.

Condition of troops.—The troops are in a determined, reliable mood in spite of great deprivations and hard fighting. Casualties so far are 25 percent.

The men had their last warm food 16 hours previously.

Ammunition situation.—There are still 40 rounds per rifle, 2,000 rounds per light machine gun, 2,750 rounds per heavy machine gun, and 140 rounds for the antitank gun. There are 50 hand grenades, 25 smoke hand-grenades, and 120 grenades for light trench mortars.

Course of Exercise as Planned

Part I.—The troops are disposed in accordance with the situation.

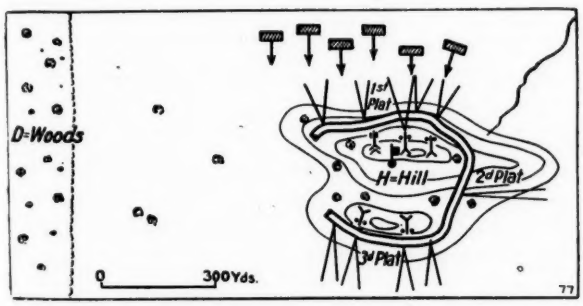
The exercise begins; the enemy in the north continues his attack and the 1st Company acts on the defensive. *Before the company commander gives an order, loud noise of battle is heard from the direction of the 3d platoon. Soon afterward the following message arrives:* "Enemy to the south is attacking; reinforced 3d platoon will hold the height south of *Hill H.*"

Probable decision of company commander: The reinforced company will hold *Hill H* and the height to the south until dusk, and will then retire as ordered by the battalion. A message concerning this matter will be sent to the battalion by messenger dog.

The *enemy* in the north and south is constantly renewing his attacks. The former is reaching a point 200 yards from the company, and the latter a point 400 yards distant.

Umpires.—Indicate heavy enemy fire, announce casualties, keep track of the consumption of ammunition.

Part II.—The supply of rifle ammunition melts away rapidly owing to the violent fire of the defenders. At 7:20 PM the umpires report the *ammunition situation at the time:* "20 rounds of ammunition per rifle, 500 rounds per light machine gun, and 750 rounds per heavy machine gun are still on hand. The casualties have increased to 30 percent." The commanding officer makes it clear to the company commander by describing the impressions of the combat and the ammunition situation that the company can no longer hold out until dusk.



Company commander's decision.—Attack and drive back the enemy in the north, then withdraw from combat and retire to the battalion. Deceive the enemy in the east and south with regard to your intentions by means of a smoke screen and your fire.

At 7:40 PM, the *company commander* gives the assembled platoon commanders the following *orders:*

1. The *enemy* has nearly encircled us. A strong enemy force is attacking from the north in *D Wood*, the battalion, which is holding *Hills 178* and *170*.

2. Under these circumstances, the battalion can give no support. The company has orders to withdraw to the battalion on *Hill 178*.

3. It is possible to *discontinue combat immediately* and withdraw across the area between here and *D Wood*, beaten by the enemy's fire, only by suffering heavy casualties. We can no longer hold out until dusk, because the company's ammunition supply is too low.

4. The company will make a surprise attack upon the enemy in the north at 8:05 PM, and drive him back; if it succeeds, it will extricate itself from combat and withdraw to the battalion in *D Wood* under the protection of a smoke screen.

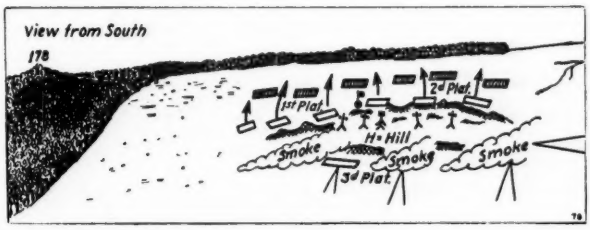
The following units will attack in the front line: 2d platoon on the right, 1st platoon on the left, central line. . . .

The platoons will fire while advancing during the attack.

The attack will be discontinued at my order as soon as the enemy has been thrown back.

Both platoons will then withdraw across that open area behind *D Wood* by the shortest route, under the protection of a smoke screen (each platoon has 8 smoke candles).

5. *The heavy machine-gun platoon,* together with the light trench-mortar section of the 1st and 2d platoons, which have been assigned to it, will support the attack toward the north from this hill. It will open fire at a signal from me.



As soon as the attacking troops are endangered, the platoon will shift its fire to the east and south and will neutralize the enemy troops there until both platoons attacking toward the north withdraw from combat. The reinforced heavy machine-gun platoon will retire to *D Wood* with these platoons.

The antitank gun will protect the troops from enemy tanks while they are attacking and withdrawing from combat. It, also, will retire with the 1st and 2d platoons.

6. The *3d platoon* will neutralize the enemy forces in the east and south during the attack and will deceive them by smoke and fire with regard to an eastward-directed attack of its own. The severely wounded will be carried back to *D Wood* with elements of the 3d platoon when the troops begin to withdraw from combat. The other platoon will cover the withdrawal of the heavy machine-gun platoon and antitank gun, and will then also retire under the protection of a smoke screen.

7. *I* shall advance between the 1st and 2d platoon during the attack. Countersign: Victory or death!

Time for watches: It is now 7:45 PM; repeat missions!"

The platoon commanders order their platoons to prepare for the attack. The *enemy* is delivering a

rapid fire in the north, but little fire in the east and south. *Observer with the enemy:* Can anything be seen of the preparations for the attack?

Part III.—Execution of attack: extrication from combat, and withdrawal.

The *enemy:* Part of the enemy forces in the north are out of action and part have withdrawn. They are delivering a rapid fire in the east and south! *Observer with the enemy:* Does the attack come as a surprise? How long does it take the Blue platoons to get out of range of the fire aimed at them on withdrawing from combat through the smoke screen?

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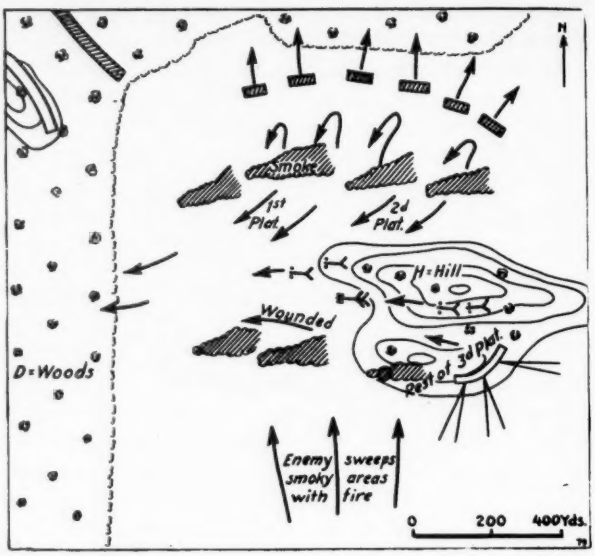

The Jap Fighting Man

The following article is based on information contained in a lecture delivered at the Command and General Staff School by Lieutenant Colonel Warren J. Clear, G.S.C.—THE EDITOR.

"The Japanese Army is a powerful, tough, well-organized force that has demonstrated beyond any doubt its ability to keep the field under the most adverse conditions. Its common soldiers have endured privations, starvations and hardships that would emasculate the resistance of a western-standard army in six months. They have a well-nigh phenominal skill in fighting in mountain and jungle country. They have a mastery of offensive fighting that can be acquired only with the expenditure of countless lives.

"It is an army of veterans, hardened and blooded by ten years of intermittent warfare in China. It knows the business of war, the small tricks of survival, the cunning, the hard work, and the pleasures of victory."

This statement by Colonel Clear brings up the questions of what type of man makes up this super-army, how is he trained, and what is his background.

The little yellow man is small, averaging five feet three inches tall and weighing about 118 pounds. He can live on a handful of rice and a little dried fish a day. He is one hundred percent literate and a tough soldier in the bargain.

From the first day that he toddles off to school, the efforts of the military factions in Japan are seen in the start of his education in Bushido ideology.* Until he is twelve, the Jap boy is infused with this ideology. He struts about the schoolyard in imitation of soldiers, sings military songs, and carries his school-books in a minature military pack. Upon reaching the age of twelve he wears a uniform replete with all the accessories and carries a light rifle. At this age, also, he participates in his first army maneuvers under direction of army officers who teach him, among other campaign practices, to handle light field-guns and hurl dummy grenades. By the time he is fifteen, the Japanese learns to charge viciously with the bayonet, to throw live grenades and drive plywood tanks. "At eighteen he has already marched twenty-five miles in one day with his school battalion, rifle, pack, and all; dug trenches, filled in latrines; strung barbed wire; acquired some degree of proficiency in mapping and a basic knowledge of soldiering." Thus when a young Jap reports for duty with the army, his commanding officer knows that the material is quite well broken in.

Conscripts reporting for duty at the age of nineteen are treated with great respect by the people of their town who turn out *en masse* in a solemn ceremony to honor them before their departure for army duty. Solemnly charged by the mayor of the town and an army officer, the recruits spend the last night at home in making obeisances to the emperor and to

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their ancestors and in contemplating the glorious position of a soldier in Japan's army.

A most important part of the Japanese soldier's indoctrination is that of his devotion to the emperor, who is to him the incarnate Supreme Being or God himself. The whole of this part of his education is pointed to the unimportance of the individual and the great importance of cooperative action of the whole in the service of the emperor. Death is "lighter than a feather," in fact to be desired if for the sake of the emperor. This fact coupled with the careful training, mental and physical, in preparation for the savagery of battle takes care of the morale condition of the Jap soldier.

Throughout the Japanese Army there is an attempt to play up the attitude of paternalism. This reaches its highest exemplification in the spirit of paternalism expressed between the emperor and each one of his subjects, who feels that he is sprung from the Son of Heaven. The fatherly attitude is carried right through the army where the colonel of the regiment constantly impresses on his men his paternal attachment for each individual. Filial deference, or piety, is carefully kept at its highest peak by daily devotions to the emporor, to spirits of departed ancestors, and to the respective parents of the soldiers.

Upon taking up his duty with the army, a Jap soldier is faced with rigorous training. His day is long, the military duties and maneuvers so hard as to be almost unbelievable to a western mind. He has a garrison ration on which most western soldiers could not exist: a bowl of soya-bean curd suffices for breakfast; rice, with perhaps a few scraps of pickled fish, constitutes lunch; and dinner ordinarily is made up of raw fish, *saké* (the Japanese wine) and some rice and sugared beans. The field ration, which makes the garrison ration look like "sumptuous fare," consists of a small tin of canned beef and some hardtack.

As for the rigors of field training, an instance is described by Colonel Clear of a forced march during maneuvers in which an infantry regiment marched one hundred twenty-two miles in seventy-two hours under rifle, one hundred fifty rounds of ammunition and a forty-five pound pack with only four hours sleep taken at the half-way mark after digging 600 yards of trenches. And to cap it all, during the last mile the commander gave the command to double-time the march into the regimental area. When it was brought out that the action was only a maneuver, the Jap CO replied, "Maneuvers are war as far as I am concerned."

In another instance when the technique of penetrating wired-in positions was stressed, "the leading echelons would throw themselves, face down, their arms folded over their eyes, into the belts of barbed-wire; and succeeding echelons would leap on and over the human bridge of their prostrate comrades."

It has been noted by observers that no matter how hard and long the march or how exhausting the field maneuvers or trench-digging, all the soldiers will manage to find water and soap with which to scrub themselves vigorously when the day is over. Following this, all weapons, including the bayonet, which is one of the Jap soldier's favorite weapons, receive a careful and scrutinous cleaning. Testimony of this fact may be noted in that no weapons captured in the Far East contained any rust, and all were in excellent and clean condition.

You have no enemies you say?

Alas, my friend! The boast is poor!

He who hath mingled in the fray of duty which the brave endure,

Must have made foes.

If you have none—small is the work that you have done.

You've smitten no traitor on the hip,

You've dashed no cup from perjured lip,

You've turned no wrong into a right,

You've been a coward in the fight!

(Anonymous)

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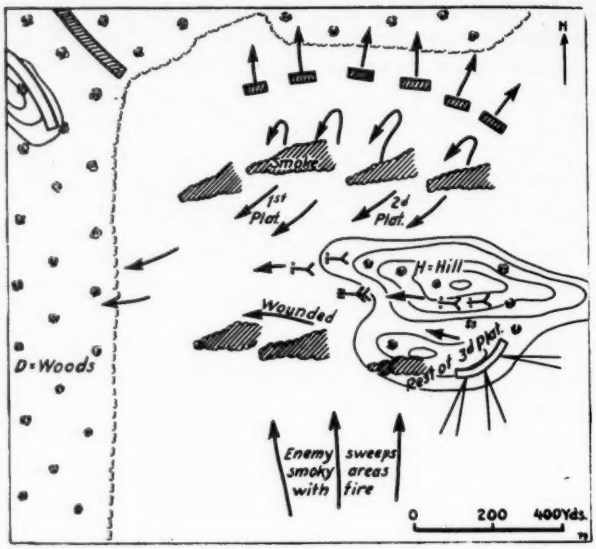

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their ancestors and in contemplating the glorious position of a soldier in Japan's army.

A most important part of the Japanese soldier's indoctrination is that of his devotion to the emperor, who is to him the incarnate Supreme Being or God himself. The whole of this part of his education is pointed to the unimportance of the individual and the great importance of cooperative action of the whole in the service of the emperor. Death is "lighter than a feather," in fact to be desired if for the sake of the emperor. This fact coupled with the careful training, mental and physical, in preparation for the savagery of battle takes care of the morale condition of the Jap soldier.

Throughout the Japanese Army there is an attempt to play up the attitude of paternalism. This reaches its highest exemplification in the spirit of paternalism expressed between the emperor and each one of his subjects, who feels that he is sprung from the Son of Heaven. The fatherly attitude is carried right through the army where the colonel of the regiment constantly impresses on his men his paternal attachment for each individual. Filial deference, or piety, is carefully kept at its highest peak by daily devotions to the emporor, to spirits of departed ancestors, and to the respective parents of the soldiers.

Upon taking up his duty with the army, a Jap soldier is faced with rigorous training. His day is long, the military duties and maneuvers so hard as to be almost unbelievable to a western mind. He has a garrison ration on which most western soldiers could not exist: a bowl of soya-bean curd suffices for breakfast; rice, with perhaps a few scraps of pickled fish, constitutes lunch; and dinner ordinarily is made up of raw fish, *saké* (the Japanese wine) and some rice and sugared beans. The field ration, which makes the garrison ration look like "sumptuous fare," consists of a small tin of canned beef and some hardtack.

As for the rigors of field training, an instance is described by Colonel Clear of a forced march during maneuvers in which an infantry regiment marched one hundred twenty-two miles in seventy-two hours under rifle, one hundred fifty rounds of ammunition and a forty-five pound pack with only four hours sleep taken at the half-way mark after digging 600 yards of trenches. And to cap it all, during the last mile the commander gave the command to double-time the march into the regimental area. When it was brought out that the action was only a maneuver, the Jap CO replied, "Maneuvers are war as far as I am concerned."

In another instance when the technique of penetrating wired-in positions was stressed, "the leading echelons would throw themselves, face down, their arms folded over their eyes, into the belts of barbed-wire; and succeeding echelons would leap on and over the human bridge of their prostrate comrades."

It has been noted by observers that no matter how hard and long the march or how exhausting the field maneuvers or trench-digging, all the soldiers will manage to find water and soap with which to scrub themselves vigorously when the day is over. Following this, all weapons, including the bayonet, which is one of the Jap soldier's favorite weapons, receive a careful and scrutinous cleaning. Testimony of this fact may be noted in that no weapons captured in the Far East contained any rust, and all were in excellent and clean condition.

You have no enemies you say?

Alas, my friend! The boast is poor!

He who hath mingled in the fray of duty which the brave endure,

Must have made foes.

If you have none—small is the work that you have done.

You've smitten no traitor on the hip,

You've dashed no cup from perjured lip,

You've turned no wrong into a right,

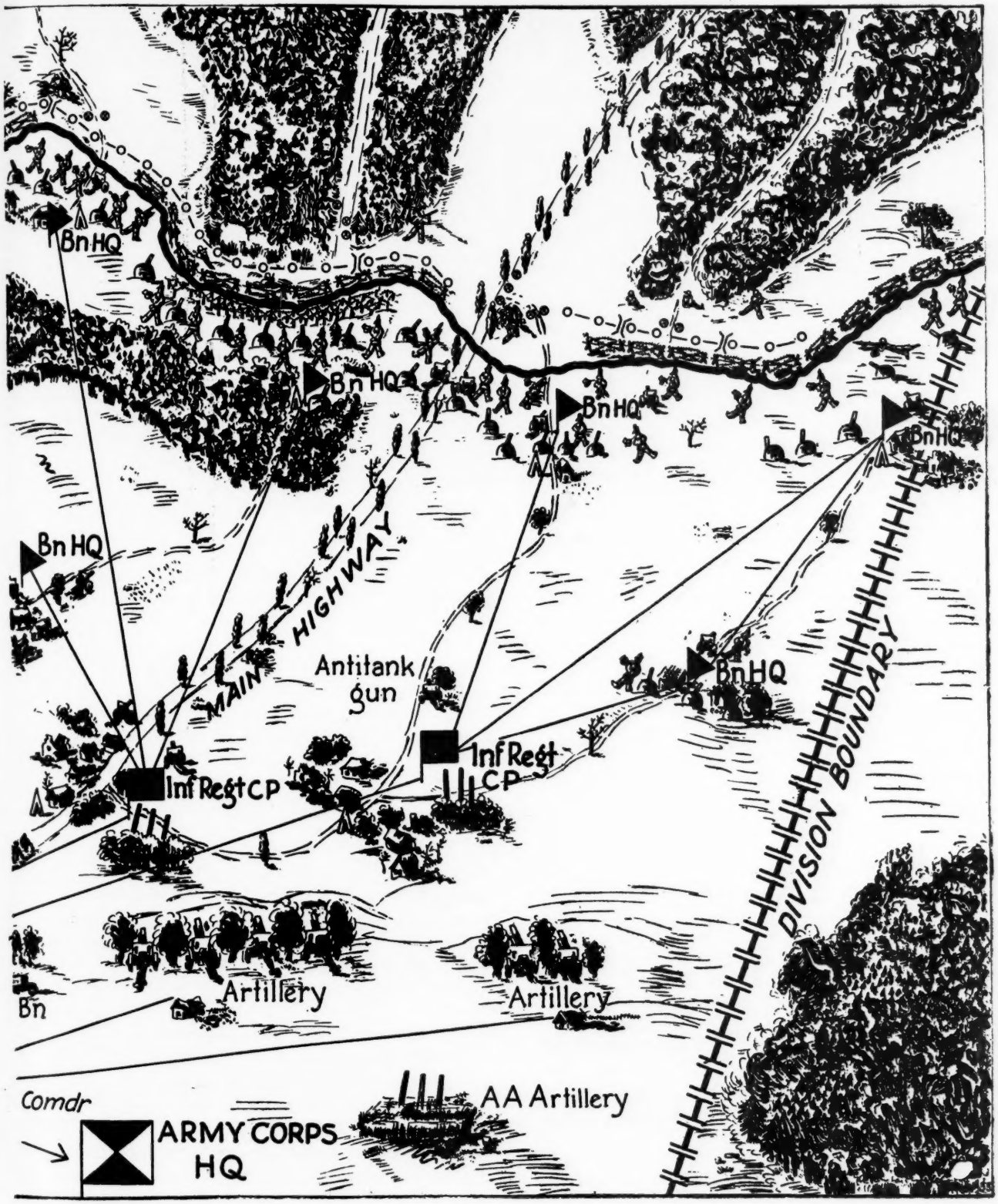
You've been a coward in the fight!

(Anonymous)

German Defense Position In the East

This drawing shows a diagrammatical section of a German division's defense position. It is typical of defense positions on the central and northern fronts in the U.S.S.R. A heavy black line denotes the main line of resistance which is reinforced by all manner of obstacles such as shrapnel-mine barricades, antitank mine barricades, "Spanish riders," other types of wire entanglements, bunkers, listening posts and scouting troops. The battalion command post is located not far

GERMAN DEFENSE POSITION IN THE EAST



from the main line of defense; further to the rear are found the command posts of the regiments, divisions and the army corps. The broken lines to the right and left show the boundaries of the divisional sector (in this drawing it is an infantry division.) Near the main line of resistance and also farther to the rear are roads, entrances to villages, etc., defended by antitank guns. Infantry guns stand in firing positions trained on enemy targets. Medium artillery is in firing position at some little distance from the main line of combat. Antiaircraft artillery protects the air above the division sector. There are no tanks to be seen due to the fact that we are dealing here with a purely defensive position, and the tank is an offensive weapon. The straight lines between the command posts and headquarters denote telephone lines or radio connections.

—From *Die Wehrmacht*

Training Problems

Taken from a platform talk given to newly arrived instructors at the Command and General Staff School

By
COLONEL HENRY E. KELLY, *Infantry*
Instructor, Command and General Staff School

Each time our country decides it has become necessary to "whip up an army" one of the first pressing problems is training, and when you speak of training the problem is *instructors.*

Expansion of our peace time army to a force forty or fifty times its size is a difficult and vital problem if we are to have a real army.

A soldier learns best by *doing;* the Army has always followed the *applicatory* system with the student actually carrying out the operations arising from instruction under the guidance of an instructor.

The logic of employing the applicatory system to troop training in time of war is obvious. However, it does present a major problem. Where can we obtain sufficient qualified instructors?

After all, the art of soldiering requires the development of numerous skills, each of which involves actual practice. How can we break our masses of recruits into small enough groups to permit adequate supervision of their practical work by qualified instructors? Too many men under a single instructor handicaps supervision of recruit efforts and consequently adversely affects progress. On the other hand to decentralize instruction to numerous poorly qualified instructors handicaps results both as to standard and standardization. Let us consider a compromise to which, for purposes of reference, we will tie the name tag "Centralized—Decentralized Instruction."

Under this system one instructor handles large numbers of partially trained assistants, each in turn handling a small group of a squad or less. The setup should permit detailed direction of the efforts of the assistants either by loud speaker or by frequent, rapid assembly of the assistants around the instructor. The subject is then broken down into a series of short steps each initiated by detailed instructions given the assistants to insure uniform and standard supervision of individual practice within the small groups. Instruction in a procedure requiring the development of practical skill requires that the instructor do the following:

1. Set the standard.
   (Explanation and demonstration of the procedure)
2. Mirror the fault.
   (Physical demonstration to the student of his mistakes)
3. Suggest the cure.
   (Analyze the reason for the failure and open to the student a new and effective approach).

Note that the method outlined permits centralized control of step 1, complete decentralization of practice (including step 2), with at least partial control of the last and most important step.

We are all familiar with the use of this method in "coach and pupil" pairing for marksmanship as well as in the four-man groups used in weapon mechanical training but its application is sometimes neglected in such subjects as scouting and patrolling, use of ground and cover, tactical principles of small units and other subjects not definitely routined but which still require the development of practical individual skills.

While both the need and application of the "applicatory" method are obvious in the troop training of small units, the fact that it is equally essential in our problem is usually overlooked. Mass production of large groups of general staff officers by short courses requires maximum effort to make *all instruction stick—i.e., "applicatory instruction."*

During the latter part of the course the problem is simple. Map exercises, terrain rides and map maneuvers all force the student to apply what he knows specifically and practically, provided, of course, the problem is well drawn and the student actually lives his part. But before he can *apply* he must have something to apply and it is in "grounding" him in the necessary fundamentals or basic techniques of the staff officer that we run into difficulties, often the result of our large classes.

A compromise between a conference or exercise conducted as a lecture on the one hand, and the plunging of the student into water beyond his depth on the other must be worked out.

In listening to a lecture the student gets "predigested food." Since he makes little effort, he remembers very little. It's a case of easy come easy go. A few days later he can recall little of what was said and less of how to apply the few facts he does recall. If we use the analogy of swimming instruction it is comparable to watching the instructor swim. On the other hand if the student is at once confronted with a stiuation completely beyond his ability to solve and left on his own to sink or swim, it cannot be said that he is being given instruction any more than is the youngster who is heaved off the boat into deep water and told to "swim or else."

Therefore we must take our subjects, analyze them and break each into steps—to permit a sort of "by the numbers" execution. Each such step must re-

quire of the student his own solution but one within his abilities.

The sum of several of these partial solutions should "open the door" to the answer which the student would have been unable to reach alone and unguided.

Let us consider a concrete case. In an early problem you will recall that the class, each as a G-3 of a flank (main attack) division, was required to decide what to include in a G-3 estimate to be presented to the division commander.

This is a pretty large order to be worked out unguided at this stage of the course. You will recall the estimate was divided into steps or subdivisions. One of these subdivisions dealt with the *attack formation* to be recommended. At this time even this is too difficult a problem to be worked out unaided. Let us, therefore, break down this problem of "formation" into a series of questions each within the ability of the student to answer, the total of these answers to hold the solution.

1. Consider first, do we have definite information of the enemy and little space for enveloping maneuver or are we located on a flank with incomplete information of the enemy but ample room for maneuver?

Since the situation pictures an open flank beyond the limit of the organized position, with ample room for maneuver the situation should obviously indicate the latter alternative.

2. Which formation will give greater flexibility to maneuver to meet the developments of an indefinite situation; a formation of "line of regiments" with all three regiments initially assigned missions and zones, or a formation of "column of regiments" where only one regiment is employed leaving two in reserve ready to meet any situation which may develop?

Again the question is such that the student should be able to arrive at the correct answer: Column.

3. If we decide to attack in column of regiments, on how wide a front could we make a strong attack (considering 1000 yards as the yardstick of maximum battalion front for a strong attack)?

Here the desired answer is 2000 yards since a regiment should rarely, if ever, attack employing all three of its battalions initially. By developing this figure after a show of hands on the alternatives of 2000 or 3000 yards, this fact may be driven home.

4. In this instance, on how wide a front do we desire to attack initially?

The situation indicates a front of about 3000 yards if we include the flank of the organized hostile position and the approach.

Students should measure and determine this frontage individually. They will remember the procedure because they have done the job.

5. Since we must attack on a front of 3000 yards, and since a battalion cannot develop a strong attack on a front of more than 2000 yards, how can we attack in columns of regiments?

This requires a little consideration, but given time, a volunteer will usually answer that if we place two battalions in assault with the battalion which is to make the main effort using the approach on a front of 1000 yards, the other battalion can attack on the interior 2000 yards, and we will still have one battalion of the leading regiment in reserve.

6. Since we are on an open flank, exposed both to the north and west, what modification in our column of regiments should be recommended to offset the danger?

The desired answer is to echelon the column formation toward the north and thus have all regiments ready to meet a sudden development from either west or north with minimum loss of time. From this we suggest as a thought to be considered always by a flank unit: *Echelon toward danger!*

7. Suppose in this situation it is necessry to develop a strong attack on the entire 3000 yards? If so, how must we modify our formation?

After allowing a little time for consideration and again using volunteers, it can usually be developed that this will involve using two regiments in line; the main attack regiment disposed in column of battalions on a narrow front and the interior (holding attack) regiment employing two battalions in line. Of course, this involves echeloning only one regiment, in reserve, toward the right rear (northeast).

8. Which of these two formations do you recommend in this instance?

This answer should be written and turned in to maintain maximum interest. Thus we guide the class to a choice between two formations where the balance is very close. Unaided they would not, in many instances, have been able to reason through the entire situation. Yet each of the "by the numbers" situations involved *independent thought* within the student's ability. Further he finally builds up a mass of knowledge from which to solve the question. He has *learned* by *doing*.

9. Does a division order usually indicate how many battalions a regimental commander will engage? If not, how will we indicate the formations we desire.

This question is usually a puzzler. The class should be given enough time to realize that they do not know the answer; that it is information they need. The instructor can then develop that the mission assigned, in combination with the terrain and frontage, indicates the formation. For example, a regimental commander given a front of 3000 yards on which to launch a main attack would inevitably use two battalions, locating his main attack battalion on a narrow front on favorable terrain and giving the other battalion the remainder of the zone. Similarly, if two regiments were used on this front the one given the wider frontage would use two battalions, the one given the main attack on a narrow front should certainly employ a column of battalions.

If time permits, the idea can be stressed that a column formation is suitable in a vague situation or one requiring maneuver, while a formation of regiments abreast develops early power to the front against known resistance. This can be further driven home by stepping outside the problem for a moment. We could transfer our front of 3000 yards to a situation where an interior division is making a main attack by penetration against strong and known resistance. Here, with all three regiments abreast, the main attack will be by one regiment with three battalions in column, while the other regiments, each less a battalion (in division reserve), would develop maximum power to their immediate fronts, since all regimental headquarters and regimental weapons should be employed to support the assault battalion.

Furthermore a relief involving a passage of lines could be executed without the confusion and intermingling which would be inevitable if one battalion of the leading regiment had to be passed through by a battalion of another regiment.

I can hear you say "But all this takes time, something we do not have." This brings up another vital point for the instructor. When time is limited do not reduce the time spent on individual important points. Rather reduce the number of basic points you attempt to cover. Usually, it is impossible to cover adequately more than 4 or 5 points in an hour. One of the most important and agonizing duties of an instructor is to pick those points. There are always so many one would like to cover. Still, it is better to deal adequately with five, rather than to give ten points a quick "once over" which will confuse rather than help the student. When you have made your decision, stick to it. Don't ramble! Those green pastures that pop up as you are talking are menaces; avoid them.

In a short course, such as ours, the fundamentals must be understood. Time is saved during the advanced stages of the course by reducing the number of times the student is required to apply the fundamentals so as to "groove them in." No good can result from starting him off on wobbly fundamentals.

Bear in mind also that we can conserve that vital essential *time* by the efficient use of student home-study. The student's efforts must be pointed directly along the desired lines of thought by pertinent study references.

A perfunctory "shotgun" reference to paragraphs of the FSR may be an easy "out" but it will not achieve results. Often the student will waste hours on such an assignment working at a tangent to the desired line. Use either study outlines, specific problems or questions which develop the desired approach. Frequently these may be the very questions discussed during class. For example, the questions we have just discussed might well have been used in addition to others, as a study assignment for the map exercise in question. What would have been the result in your opinion? Would his study have been directed along worthwhile lines?

Each student would either have had an answer to each question, in which case he would be on the alert to see if he had "hit it on the nose," or else, realizing that he could not answer the question, he would have been alert to get it.

I wonder if we realize how, as instructors, we all compete for the student's available interest or ability to concentrate. Exposed as he is to information for seven or eight hours a day, nature rapidly builds up an immunity to information. This immunity becomes progressively stronger as both the day and the course grow older. Work must be presented so each student has difficulty in evading it. It is not what you say but what the "customer" takes away that counts. Remember that. He gets out of a given period just what he puts into it. Your problem is not to present a *polished address* but rather to direct his energies so he will get the maximum out of his own efforts.

You will note we have said nothing of personal appearance, voice or mannerisms of the instructor. Each of you should have someone check your voice and mannerisms, however. Often one fails to realize his own peculiarities. Many a "hand-wringer" or "weight-shifter" is perfectly innocent. By now you are all aware that an instructor should be careful to avoid distracting attention from his subject to himself.

In closing, bear in mind one last point. When you are on the platform before a class of a thousand, to how many persons are you talking? *One* and *only one!* But that *one* must be *each individual man in* the class. Each should feel that your words apply particularly to him. Talk naturally, your mind jumping from idea to idea—not from word to word. *Remember, you talk to people; not at them!*

The School of Military Government

By
BRIGADIER GENERAL C. W. WICKERSHAM, *United States Army*
Commandant, School of Military Government

The military occupation of enemy territory suspends the operation of the enemy's government in the territory occupied. Under the Hague conventions, the occupant is then responsible for restoring public order and safety. This is done by the military forces under the command of the commanding general of the theater of operations, who is the military governor. The exercise of military government is a command responsibility, and the assistants to the military governor are known as civil affairs officers. They are the administrators of military government.

In none of our former experiences was the Army prepared for this task. Military government was established in the Coblenz area at the end of the last war, and the officers detailed to the work, numbering about 230, were compelled to learn their work as they went along. It is a monument to their ingenuity and resourcefulness that they accomplished as much as they did. The lessons learned from that experience were embodied in a report prepared by Colonel I. L. Hunt, the officer in charge of civil affairs of the Third Army and American Forces in Germany. Colonel Hunt expressed the hope that never again would our Army be called upon for similar duties without adequate preparation and training.

The Hunt Report was used as the principal basis for the Army Field Manual, 27-5, Military Government, which lays down the policies and outline of organization of military government, and postulates the necessity of adequate training of officers for the work.

Unless we were to be as badly prepared as in all of our past experiences, it was clear that intensive training was required to prepare civil affairs officers for their difficult and important task in many parts of the world in this global war. The School of Military Government was accordingly established by the War Department at Charlottesville, Virginia, for the training of officers for subsequent detail in connection with military government and liaison under the supervision of the Provost Marshal General. Facilities were furnished by the University of Virginia. The first class commenced on May 9, 1942, and graduated on August 29, 1942. The second class followed and will be succeeded by subsequent classes. The graduates are available to commanders of theaters of operation, departments, task forces and others, for military government, civil affairs and liaison duties. A large portion of the first class are now engaged in the performance of their duties in various parts of the world.

The School's system of instruction is analogous to that used in the War College in past years. Lectures are given by members of the faculty and by many others drawn from colleges and universities and various branches of the government. The class is divided into committees to whom problems are issued periodically for solution. These usually include an estimate of the situation as existing in the particular area under consideration, definite recommendations for the organization, establishment and functioning of military government in the area, a recommended decision and a detailed plan. Solutions must be based on the known facts which are set forth in a survey made by the committee, and the committee report is presented at a meeting of the class for discussion and review. Lectures, reading and seminars are geared up to current problems. In this way a student combines the acquisition of knowledge with the application of what he learns to existing circumstances, and at the same time becomes familiar with necessary staff procedure. The object is to train him to be of practical use to his commander in the field.

The curriculum includes courses on Army organization and staff functioning, the international law of military government, the American regulations, American experiences in military government, the experience of other countries, public administration, politico-military backgrounds and liaison. The principal enemy countries, as well as various special areas, are given intensive study, including their system of government, political history, economics, social psychology, geography and legal systems. Problems require surveys of designated cities, states, provinces, or countries, the data for which are obtained from various sources, through the War Department and elsewhere, from libraries all over the country and from visiting lecturers having special knowledge of the areas under discussion.

A great amount of effort is included in the four months' course, and the School has developed a definite procedure for the organization and operation of the civil affairs work in foreign territory. When our troops are invading hostile or semi-hostile territory the first contacts with the civilian population are made by the military police. It is usually impractical to establish organized military government in the combat zone. The immediate problems of the maintenance of law and order and the control of the civilian population ahead of the zone of communications can be handled by the military police and by civil affairs

officers sent forward for the purpose in accordance with plans prepared by the civil affairs section at General Headquarters and approved by the theater commander. As the combat zone moves forward, formal and organized military government may be established in the zone of communications. The over-all planning and supervision will be handled by the civil affairs section on the staff of the theater commander. Smaller sections on subordinate staffs will engage in similar work for their units. In many cases, the organization, however, may be territorial rather than tactical. If the invaded area is divided into appropriate subdivisions, an officer in charge of civil affairs may be appointed for each subdivision and an appropriate staff assigned to him. Where larger cities or countries are included, there may be an officer in charge of civil affairs for each city or country within the area.

It has to be borne in mind that the civil affairs section on the staff of the theater commander, once organized, has no responsibility for the military functions of other sections of the staff, and they have none for the conduct of civil affairs, although they will of course consult together and concert their measures when necessary. For this reason, the civil affairs section at headquarters of large theaters of operations should have its own coordinating group under the officer in charge of civil affairs. The section differs in this respect from other staff sections.

Some idea of the functions of the civil affairs section may be conveyed by the statement that they include all fiscal matters affecting the civil population, such as currency, banks, and taxation; public works and utilities, public safety, the judicial system, including both military commissions and provost courts for the enforcement of the proclamations and ordinances of the theater commander, as well as the supervision of the judicial system of the country; public education, including schools and colleges; public welfare; public health and sanitation; and communications. An extremely important function is that of economics, which includes supervision of the agriculture, manufactures, and trade of the occupied territory; its mines and oil wells; exports and imports, food, fuel and other necessities, the supply of labor, strikes, lock-outs, and disputes, and like matters.

The functions of liaison officers are not so well known, but they are of great importance in many situations which are not conventional military government or not military government in any sense. Where we have troops in friendly countries, the relationship between the commander and our troops on the one hand and the civil population on the other requires a staff officer or section to handle for the commander the many questions and problems arising that affect the troops. A knowledge of the country, its people, government, habits, customs and economics is vitally necessary in order to prevent mistakes, assure smooth cooperation and obtain the best results. With this knowledge must be coupled an understanding of technique and of methods most likely to secure desired results. Training and instruction in these subjects is an essential part of the training program.

Many intermediate situations may arise, and the trained civil affairs officer must be prepared with proper solutions for them. For this reason instruction and training must be pointed towards intelligent thinking rather than rigid or routine solutions.

The School of Military Government is engaged in the training of those who will be the administrators of civil affairs in the field during the period of military necessity and until a civil government is set up and recognized. It is not engaged in training proconsuls. A large staff will be needed for the conduct of civil affairs in occupied territory, and the graduates will be available to take their places in the appropriate sub-sections and divisions of the civil affairs section. Their work will be essentially administrative. For this reason the school is not engaged in technical training in the particular departments of running railroads, water works, or telegraph lines, hospitals, schools, bank, or business houses. The training is designed to assist officers in preparation for the administration of the various functions, and many students already possess background qualifications which will be of great value to them.

The policy laid down by the manual is to endeavor to prevail upon local officials, engineers, doctors, and others in occupied territory to continue their work. However, it is recognized that American technicians may be required in various parts of the world and that assistance will be needed from other departments of the government. For this reason, the School of Military Government is only a part of a larger program which is in charge of the Military Government Division in the Office of the Provost Marshal General. In addition to the training of civil affairs officers at the School, steps are being taken for the training of junior assistants at the Military Police schools, and of occupational military police, and the selection and ultimate training of the necessary technicians. Moreover, the Division is engaged in broad planning for military government with estimates prepared by the School.

The School of Military Government is both a training institution and a laboratory for plans, estimates, and doctrines that will be of assistance to our armies in the field. A small graduate cadre concentrates on this work with the assistance of the faculty.

The staff and faculty of the school have been drawn both from the Army and from civil life. They include men of wide experience in the subjects that are dealt with.

The students are now selected both from the Army and from civil life. Exceptionally qualified civilians may be commissioned for the purpose. It is, of course, important that only those of the highest

qualifications for the work should be chosen. For that reason, the final selection of recommendations submitted by army and service command commanders, chiefs of administrative services, and others, are made by the School subject to the approval of the Provost Marshal General.

While the civil affairs officer is not engaged in combat duty, the success of his efforts will have a direct bearing on the success of the campaign. If he does his work well the communications of the army will be unhampered; food, ammunition, reinforcements and replacements will arrive on time and the commanding general will be able to employ his combat troops without loss by large detachments for the protection of his rear areas. On the other hand, if the civil affairs work is done badly, revolt and sabotage will occur in the rear areas. This will not only prevent the steady flow of supplies to the combat zone and seriously interfere with close cooperation between that zone and the zone of communication, but will also compel the use of tactical units to maintain law and order, to control the civilian population and to protect roads, railroads, telephone and telegraph lines and other vital installations.

If the administration of civil affairs is marked by harshness, injustice and oppression the civil population may be driven in desperation to the formation of suicide squads of guerrillas on a scale sufficient to require the use of large numbers of troops to suppress them. We have seen this happen in countries dealt with by the Nazis, with their harsh and inhuman methods—the worst since Attila the Hun. On the other hand, if the conduct of civil affairs is marked by such an extremity of softness as to encourage a hostile population to disobedience of necessary ordinances and provisions for the safety of our troops, equally poor results will be obtained. Between these extremes the theater commander and his civil affairs section must steer their course.

History teaches, and the manual states, that military government should be mild rather than harsh. "As military government is executed by force, it is incumbent upon those who administer it to be strictly guided by the principles of justice, honor and humanity—virtues adorning a soldier even more than other men for the very reason that he possesses the power of his arms against the unarmed. * * * A military occupation marked by harshness, injustice or oppression leaves lasting resentment against the occupying power in the hearts of the people of the occupied territory and sows the seeds of future war by them against the occupying power when circumstances shall make this possible; whereas just, considerate and mild treatment of the governed by the occupying army will convert enemies into friends."

This doctrine emphatically does not mean that military government must be lacking in firmness. On the contrary no worthwhile results will be obtained, particularly in the countries of our principal enemies, without firm and just enforcement of the rules that are necessary for the maintenance of law and order, for the protection of our troops and for the safeguarding of the military government. This task will be rendered easier by the American policy, and by the provisions that will be made for the relief of the civil population.

The mission of the School of Military Government is clear. It is to train an increasing number of officers in the principles, technique and application of military government and liaison so that wherever our troops go there will be trained personnel to assist the commanding general in his relations with the civil population, and in the vitally important task of the military government of occupied territory so long as military necessity exists.

The Practical Side of Court-Martial Trials

By
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Every eligible officer in the Army will some day run through the day's debris on his desk and discover himself to be a "Judge, Trial Judge Advocate or Defense Counsel" for trial on a court-martial. Many have already had this experience.

When you are appointed you may immediately suffer the reaction of chagrin, fear, dismay, interest or boredom. Only that of interest is justified. Assuming that you are a tyro, you will have to learn much. It is your duty to prepare yourself thoroughly because you are charged with the responsibility of decisions which can ruin the lives and disgrace the families and relatives of soldiers and officers as well. You should review your *Manual for Courts-Martial* at once. It is well to ascertain beforehand the general nature of the case to be heard and review the elements of proof required by the Manual.

Assume that you are appointed as a member of the Court. The novelty of the judicial robe will soon wear away, but service on the court should never be allowed to become routine. The subject matter is not theoretical but involves the rights of flesh-and-blood human beings. Always remember this is a big moment and a tremendously vital one to the accused. Therefore, solemnity, fairness, decorum and dignity are the ABC's of a court-martial hearing. This is not the movies, a jack-rabbit or kangeroo court, but a court-martial, of ancient and honorable lineage, with a reputation to maintain. Examination of witnesses, no matter by whom, must always be accomplished with these thoughts in mind. Third degree methods, badgering and brow-beating of witnesses, no matter by what interrogator, must never be countenanced. This does not mean that a strong and, if necessary, severe and even lengthy cross-examination should not be permitted in a proper case. But extreme good judgment and balance must be observed at all times to the end that the hearing remains that of a judicial body and not one of the nature of a "sweat box." If the accused is found guilty, the sentence should be announced without omission of any ceremony and with full attention by all personnel of the court. There is often a tendency among busy officers to commence gathering up papers, books, equipment and the like while the accused is hearing the fateful words which usually mean everything to his future. Thus an impression is created of "slaughter house justice"—knock him on the head and bring in the next victim. Such casualness has no part in a hearing which to most of those on trial is more to be dreaded than bullets.

It will not be disputed that discipline cannot be maintained unless prompt and suitable punishments are meted out for infractions of regulations. A regulation is nothing but sounding brass, "full of sound and fury, signifying nothing," unless it is enforced. Its enforcement is ultimately in the hands of each officer called to serve on a court-martial.

Prompt and certain justice is the greatest deterrent to dereliction. It must be remembered along this line that inadequate sentences and excessive ones stand in the same shoes as destroyers of morale. Therefore it would seem wise to determine upon a sentence for the run of the mill offense of a given type and using that figure as a yardstick, to vary the sentence only as the facts show the particular case to contain aggravating or mitigating circumstances. This is particularly the case in sentences where the maximum punishment is unlimited, notably in desertion cases (by far the majority of cases which courts-martial hear). It avails nothing to adjudge a violent sentence, for example, when you know that the reviewing authority has established a policy of sustaining only a much lighter sentence in such a case.

Thus, in a certain Command, for instance, a sentence in an ordinary type desertion case will—under the present policy—be held to one and one-half year's confinement where the desertion is terminated by apprehension and to one year when terminated by surrender. A sentence greatly in excess of this mean will not, in an average case, dignify the court in the eyes of the soldiers, because the fact that it is sawed down is bound to be discussed to the disadvantage of the reputation of the "judiciary."

On the other hand, clemency is always for the reviewing authority. A fair sentence should be returned according to the facts. Thereafter, if it is appropriate, it is perfectly proper to join in a request for clemency addressed to the reviewing authority. But sentence should not be tempered by considerations of sympathy and clemency. Those are matters without the sphere of the court-martial hearing. "Tears are not for the court." If clemency is indicated, never fear, there will be plenty of opportunity for it to be exercised later, and it will be.

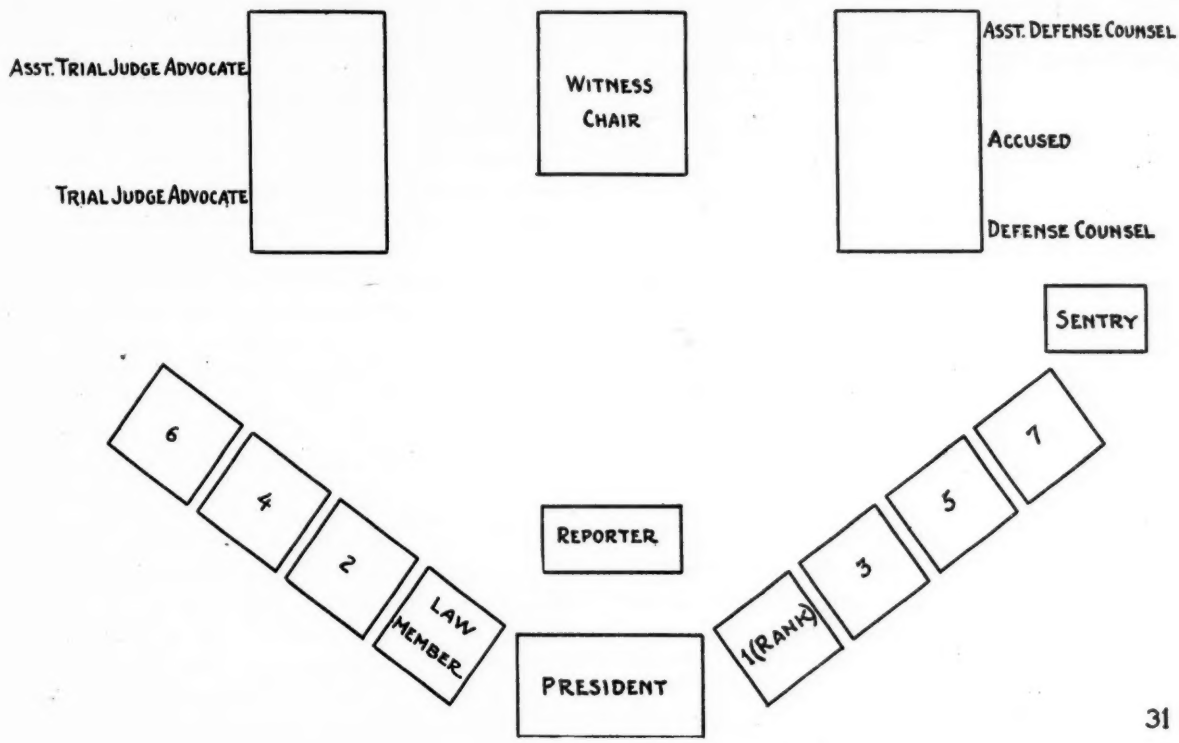
Different questions may arise in trials, several examples of which follow:

a. *When is the accused a deserter and when AWOL only?* Prepare yourself for this by carefully reading your MCM, pages 142, 143 and 144. Desertion is not a question of time but of intention; the latter may be determined by circumstances; AWOL

with intent to avoid hazardous duty or shirk important service may be desertion. One day's absence may involve a desertion. The idea, prevalent in some places that there must be an AWOL for a certain number of days before desertion is evidenced is a fallacy.

b. *What deductions are made in case of forfeitures of pay before the two-thirds per month maximum may be figured?* Remember first that forfeitures must be stated in dollars and cents, not months and days. Then with that in mind, if the forfeiture is ⅔ of pay per month for a given period, deduct the compulsory allotments (wife and/or children), then take ⅔ of the balance and subtract 10¢ for Soldiers' Home deduction where such appears. Do not adjudge confinement for over 30 days without forfeitures nor confinements at all without hard labor. If the sentence reduces the soldier's grade, figure the forfeiture on his reduced grade. Sentence of a noncommissioned officer to confinement should always carry with it a reduction to the grade of private.

c. *Must you as a member of a court-martial remain silent when hearsay, conclusions, argument, immaterial matter, secondary evidence and prejudicial statements appear in the evidence or emanate from the mouths of counsel, or even of the court?* No. As a member of the court, you are privileged, in fact duty bound, to object to anything improper that appears in the trial. To be sure, your objection is ruled on by the law member or the president, as the case may be (See MCM pages 39, 40 and A. W. 31), but in any event you have placed yourself on record and have attempted to keep the court on the beam. Ordinarily your efforts will be successful if you have the provisions of the Manual in mind and apply them. Along this line, avoid blurting out unconsidered remarks or objections, but think your offering through before you deliver it. Among the more frequent objectionable remarks are references to a soldier accused of desertion as the "deserter" and to one accused of escape as the "escaped soldier." Where "desertion" or "escape" appear in morning reports or similar records, the court should always be specifically advised they are not in and of themselves any proof whatever of "desertion" or "escape" respectively. Watch like hawks so that evidence, no matter how back-handed, of other offenses by accused is not admitted where such evidence appears before a finding of guilty. Nothing more prejudicial can well be imagined. The error may be cured by a prompt objection and a ruling that the objectionable reference be stricken out. If it does not clearly appear that a party desires to waive his objection, failure by either side to object does not waive the objection (except as to genuineness in case of admission of documents). This is quite different from the civilian rule.



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d. *When is an accused "drunk" so as to subject himself to the pains and penalties of the "Articles of War?* In "soldier talk," a soldier is not drunk if he is still able slightly to twitch his least finger. In the poet's thoughts:

> "He is not drunk, who from the floor
> May rise again and drink once more,
> But drunk is he who prostrate lies
> And cannot either drink or rise."

Not so in the view of the Articles. If you are the accused and you suffer "any intoxication which is sufficient sensibly to impair the rational and full exercise of the mental and physical faculties," why then, "You're drunk, Sir." Read that again and study it—not that the shoe has ever been your size, but that you may be prepared to judge the evidence properly in an appropriate case.

e. *May a Court-Martial find the accused guilty of another offense shown by the evidence but not charged?* In a certain class of cases, yes. Where a "lesser included offense" appears, accused may be found guilty of that offense by exceptions and substitutions. Most officers are very familiar with the fact that a finding of guilty of violation of AW 61 (AWOL) vice AW 58 (Desertion) falls under this heading. One less often occurring is a finding of "wrongfully taking" under AW 96 instead of "feloniously taking, stealing and carrying away" under AW 93, in the case of a joyrider, warmed with *spiritus frumenti,* who simply "borrows" a stranger's car for the pleasures of the moment with no intent permanently to deprive the owner of the vehicle. Generally speaking, a lesser included offense must include no more or different elements than are contained in the original charge but need not contain all those elements. The distinction between lesser included and those not included is often difficult to draw. For example, the offense of loitering on post (AW 96) is not a lesser included offense of sleeping on post (AW 86). Nor is leaving post before being relieved. In case of grave doubt, there are at least two courses open to the court: Find the accused guilty of the offense you believe the evidence establishes, or suspend the trial and request directions from the appointing authority as to the applicable law (see MCM par 74). The former course should be followed in most cases inasmuch as the appointing authority may always correct errors, except where a finding of not guilty is made or an inadequate sentence imposed, and time may be wasted by the other method.

f. *May the court request additional evidence?* Yes, and the case may be continued for that purpose. Ordinarily, however, if the evidence is purely cumulative the case should not be delayed. The rights of the accused must be fully protected; so must those of the government. Nevertheless, it must always be remembered that "Justice delayed is justice denied" and that speedy justice is sure justice.

The principles stated herein are applicable both to special and general court-martial trials in appropriate cases. Summary courts-martial must follow them broadly, likewise, lest they degenerate into decisions like those of Judge Bean, the "law west of the Pecos," where the finding and sentence was first placed under an empty stein and the judge thereafter heard the evidence, then meted out his predetermined justice.

In conclusion, it is well to remember that in General Court-Martial trials, the Trial Judge Advocate has the benefit, before the trial, of the considered advice of the appointing authority and his staff judge advocate; that the evidence presented has been thoroughly investigated and in all likelihood has been examined in advance by those officers; that they have concluded that at least a *prima facie* case is established. The anticipated evidence, of course, may not develop at the trial as indicated, so that even though the above thought is borne in mind, the guilt of the accused must in no event be presumed from the mere fact that he is being tried. In the Army, as in civilian life, the accused is always enfolded and upheld by the presumption of innocence, and this presumption attends him until the very moment that the court, by a lawful finding, declares him to be guilty. This is a vital rule of procedure, and it must be observed in spirit as in letter.

The general rules of Courts-Martial are the rules of good judgment and common sense. If you follow them, you cannot be far wrong.

Combat Intelligence Training in New Divisions

By
MAJOR JAMES W. BELLAH, *General Staff Corps*

In all combat intelligence training, be guided by three basic ideas. Fix them firmly in your own mind at the start—fix them in the minds of your S-2's, and see that they get through to the men.

They are to train—

1. So that your men learn to see and to hear all enemy activity within their horizon of action—and interpret its military significance within the light of their experience.

2. So that they can do this lightfootedly, cagily, cleverly—so that they don't die while doing it—so that they get away at the right moment with their information.

3. So that they learn always to orient *themselves* by maps and terrain—and position *what they see* or hear by map and terrain, that they may plot their information accurately and get it into the channels of intelligence communication quickly.

For yourself, G-2, fix firmly in your own mind that you are merely the coordinating focal point of this information—that you are not a clairvoyant superman, nor are you expected to be. Your job will be well done only insofar as the training of your division is well planned and supervised and the enemy information that results from it is well coordinated.

Get the information and that information is your stock in trade. Sometimes it will give you a perfectly logical conclusion for your estimate of the enemy situation. Nine times out of ten, in the confusion of combat, it will give you nothing—be nothing but heterogeneous fragments of enemy information. Don't ever strain for conclusions; don't ever guess; don't ever wishfully hope. When it is just a confusing potpourri of enemy information that means nothing to you—rest with it; wait it out; don't try to be a bright boy—always remember that it is better to keep your mouth shut and let people think you are a jackass, than to open it and remove all doubt. And in combat, opening it on a guess or a hasty piece of chain-thinking may put the blood of a division on your hands. Teach that thought to all your men.

Now, in your early stages at Leavenworth (where you will be taught all of the bookkeeping involved) in the New Division Course, you will begin to collect fragments of directives that refer to your job. These will be from the Army or the Corps you will be activated as a part of. Something like this, which is paragraph 34, FM 30-5, will crop up among them—

"Training in military intelligence will not be restricted to personnel assigned to the military intelligence sections of various headquarters. Appropriate instruction in this subject will be given to *all officers and enlisted men* because every officer and enlisted man has a part to play in military intelligence. All officers should be impressed with the fact that collection of intelligence is an important function of command."—because, at last, the thought is becoming prevalent that the function of intelligence must be a continual function of *all members* of a command (as it is in the German Army) rather than a specialized function of those individuals set up within a command as intelligence personnel by the tables of organization.

This immediately gives you about fifteen thousand men to train instead of a hundred or so. Don't let it frighten you, because it can be done efficiently and fairly easily by intelligent planning, ingenuity and a rational application of the method of strict decentralization.

Your first step is to have the commanding officers of units that do not have S-2's on the table of organization appoint officers for additional duties as S-2's and keep them in the S-2 job: the commanding officers of the medical battalion, the quartermaster battalion, the reconnaissance troop, the signal company and the headquarters company. All of these S-2's must attend all of your S-2 schools and conferences. In a sense all must be, eventually, combat S-2's. So get these unofficial S-2's thinking that way from the start.

Regimental and lower unit intelligence schools start at about D plus 45. They should be limited to the afternoons with one or two night periods—and *dark* night periods—a week, and if the training is practical, progressive and full of hard punch, thirty days should turn out highly competent sections and platoons—but never stop the training until the armistice!

The tendency with new and inexperienced G-2's will be to hold the instructors' school long before the regimental and lower unit schools start. This must not be done for two reasons—

1. The longer you hold off on the instructors' school, the more time you give to lower unit commanders to appoint battalion S-2's and ad-

ditional noncommissioned officers, and therefore the more people you reach with your instructors' school.

2. The nearer the instructors' school is held to the time lower unit schools start, the fresher the lessons are in the instructors' minds.

But prior to D-day and at stated periods thereafter until the instructors' school starts, you must hold several S-2 conferences and have the cadre intelligence noncommissioned officers attend these conferences. These conferences are for three purposes:

1. To have all S-2's know each other, know you and to become acquainted with the methods of instructor-training and intelligence-training you wish to standarize on.

2. To provide all S-2's with material to study that they may increase their own professional knowledge by progressive work prior to the start of their schools. (This includes your own private clipping library of *this* war, which one hopes you started on 7 December 1941 or before.)

3. To alert S-2's to the necessity of picking filler replacements carefully to fill the regimental platoons and battalion sections. (Young high school graduates and athletes are suggested as the basis. Individualists!)

In these conferences stress the point that one of the most important tools of an S-2's job is a thorough knowledge of his own division's organizational and tactical set-up. Have him total up in his own mind what he knows and what he doesn't know—and inspire him to get out and fill up his military gaps prior to D plus 45. Have him study the reconnaissance troop, its functions and tactics. If he is a Dough, get him to learn something of the artillery—and vice versa. If you have an observation squadron handy, take your S-2's over and get them to know the pilots and observers (a social contact with Air is a great aid in close cooperation between Air and Ground. Always know your observation squadrons personally.) Fly your S-2's if possible prior to D plus 45. At least have them talked to by air officers on the limitations and capabilities of Air—get them air-conscious from the start—have them know Air as an integral part of their work.

Show training films to your S-2's in this preliminary period so that they may pick those they wish to use later in their own schools. Suggest training aids, simplified methods of approach, dramatic and competitive methods of teaching. Have your S-2's make up their own school schedules and submit them to you for criticism. Emphasize demonstration and practice rather than lectures.

Then, at about D plus 30, run a five-day instructors' school (afternoon only) for a final tie-up of teacher-methods before you turn your S-2's loose on their own schools. But that doesn't end your job. Be available, on S-2's call, to appear and assist at those schools. Inspect those schools eternally. Put your personal fire into them. Watch them like a hawk but, never violate the principles of decentralization.

In the infantry regiments and in the engineer battalion, the keynote of the schools should be a return to Indian fighting methods. (We haven't so far to go back to them in this country.) Go back! Use the principles of commando training—never failing to impress it upon intelligence personnel, however, that they are not Captain Wermuths—that there will come a time on all their missions when they must cut and run from it no matter how tempting the target—to accomplish their primary mission of getting back with information. Teach them to crawl soundlessly and slowly and endlessly. Teach them to walk on board flooring noiselessly—to open and climb into windows without a sound—to open doors without a squeak— to wade through water without a splash—to cut wire. Encourage them to buy spring knives (which can be opened with one hand) with at least a three-inch blade. Teach them the elements of knife killing. Post sentries and let your men try to crawl to them and overpower them without being seen by the sentries. Suggest the piano wire garrote—make one and exhibit its use. Teach men to catch the bodies of victims as they fall so that they make no thud.

Run night problems on the detection of noises, the judging of the distance of these noises, the judging of the direction. The snick of a rifle bolt, the clink of a mess kit; footsteps on soil, gravel, concrete, boards; a distant concrete mixer, the starting and sound of various motors. Acquaint them with the sounds of rifle, machine-gun and artillery fire at varying distances during your range seasons. Let them judge distances and directions by day and the same distances and directions by night. End night class problems by having an armed patrol surprise the class by creeping up on it and disclosing its soundless arrival with a flare. Always work elements of the command against other elements in this way to interlock training and save your precious training time.

And use every trick method you can think of to teach the men continual alertness, *not* on their front, *not* on their rear, but on all sides and overhead—at all times. (In this G-2's division, two days ago, a class of distance judging was warned twice in 20 minutes to keep alert for air. Ten minutes after the second warning, a squadron came in low over the trees behind them, by careful pre-arrangement, and bombed them with flour at ten feet. But half an hour afterwards when a plane passed overhead, no one looked up. Gentlemen, it won't do! You must alert them to the enemy air arm, continually and from the start, for planes will hit them first, long before they have reached the terrain where they

will be committed to ground combat. Don't let them die uselessly—for want of your foresight!)

See the Chemical Warfare Officer and the Division Engineer and coordinate their training with regimental intelligence training, so that smoke and demolitions can be used to the fullest. Above all, harden your men eternally and steel them for a sparing use of tobacco (one cigarette an hour should be ample for any man). Show them what lighting a cigarette at a thousand yards looks like at night. (It will surprise you.)

Alert their minds in every way you can by continually questioning on what they see about them—and the significance of what they see. Teach them to observe at 20 miles an hour from trucks. (Use driver training trucks if transportation is scarce.)

Make athletes, cat burglars and silent killers of these men in the regimental platoons and battalion sections and in the engineers, and it will repay you a hundred fold—just as the training will repay them by saving their lives in combat many, many times.

But when you are done, you have trained only a small portion of the command. So, at the very start, double the number trained, by having an alternate designated for each intelligence noncommissioned officer and man in the regimental table of organization. Triple the number, if possible, by having two alternates designated. (Some day this highly trained, highly specialized, highly expendable intelligence personnel will be organized in its own regimental set-ups, probably under Corps, for continual training, for combat attachment to infantry during action and to protect it from the hundred other jobs commanders find for it when there is no immediate need for its vital sneak and peek function.) Train these alternates in the intelligence schools if you can. If you can't, assign one or two alternates to each intelligence man and encourage his preliminary training by individual tutoring. These alternates are your combat replacements—vital to your system.

This alternate system can be sold readily to any far-seeing regimental commander. So, sell it personally, G-2. And keep up the alternate's enthusiasm by the knowledge that he will fill the first vacancy that occurs in the regular intelligence set-up. Have alternates designated in advance also for your battalion S-2's and your regimental S-2's if you possibly can—a young inexperienced second lieutenant will do—if you train him.

We are now spreading intelligence training through the regiment. Spread it further. Every vehicle driver in a regiment should be a potential observer. He has a wider horizon in combat than the man on foot. He gets around. Require your S-2's to give him a school in the fundamentals of observing and in map and terrain work—and in the means of communicating information to the regimental or battalion S-2's.

Spread it further. Have your S-2's prepare a series of combat intelligence talks to all the officers in regiment. Talk to the officers of the three regiments yourself on the function.

And finally have all regimental and battalion S-2's and noncommissioned officers alerted continually to help in instructing all units in scouting and patrolling, and map and terrain work, by putting on demonstrations with highly trained details.

Train your own G-2 section for this demonstration work and use it to help regiment. Let its clerical function always by secondary. You are at war!

You have now gone far toward alerting every man in your three regiments and in the engineer battalion to the intelligence function, and you have decentralized the training to reach most of them. The final tie-up is to mark in some unofficial way the actual intelligence personnel, officers and men, set up in the table of organization—so that anyone else in the command who has spot information can look for the marked man in combat, get it to him, so he can put it in the channels of intelligence communication.

This, —|—|—|—, in red crayon on the rear of tin helmets and in red India ink on a sewn-on right shoulder patch, is suggested to distinguish intelligence personnel. It will start as a distinguishing mark, but very shortly it will become a mark of distinction and a help in morale and training and *esprit de corps* of the platoons and sections if you have done your job well.

Now, a lot of space has been filled by this discussion of intelligence training in your three regiments and in the Engineer Battalion—but this is the backbone of your system and too much emphasis cannot be placed on it. Air will fail you at times in deep reconnaissance due to weather, matériel failure and the action of enemy aircraft. The activity of the reconnaissance troop will at times be limited severely by terrain and counter-reconnaissance. But there will never be a time in combat when the scout on foot cannot function to some extent—if you have trained him well and kept him alive. He is the ultimate eyes and ears of your division—the man you can always count on. Train him, protect him, imbue him with the sacredness of his mission always—the safeguarding by reconnaissance and observation of fifteen thousand men—and remember that it is in the realm of possibility that he alone—one individual—on some dark night, may save the entire command by his alertness, his cleverness and the knowledge of the military scheme of things that you have pounded into him.

Division Artillery

It is a very good plan at the start to have a thorough understanding with your division artillery S-2. There will be, in each of your four artillery battalions, an S-2 also but the T/O sets up no further artillery intelligence personnel as such. The

battery details with their instrument, survey and communications men have the mission of intelligence, and it is a good principle at the start to decentralize their training directly to the division artillery S-2. He will not scotch the job, as too much depends on the efficiency in combat of his battery details, and the attainment of that efficiency assures you of adequate artillery intelligence coverage.

Consider artillery intelligence as a system within a system. It puts in its own observation posts and has its own net of communications. Know this system as well as you know the back of your own hand, but do not try to combine its training with your infantry intelligence training. Have your artillery S-2's attend your instructors' schools and see to it that each artillery battalion S-2 knows the infantry regimental S-2 that he will habitually coordinate with in combat team. Run joint problems designed so that the artillery S-2's and the infantry S-2's will have a thorough, interlocking grasp of each other's needs for cooperation. *But do not run joint schools for personnel.*

Hat-cord consciousness is a thing of the past when you are training for combat. Endeavor to have all branches know the jobs of all other branches and to be able to do some of them passably well, but remember that the artillery intelligence function is an adequate and highly dependable *by-product* of other artillery functions, and give free rein to your artillery S-2 in training for those fundamental functions. If you do, you satisfy your own mission. Artillery observation details are trained and organized primarily to locate targets. However, they are often in positions for general battle surveillance, and if trained to do so, can contribute greatly to the gathering of enemy information. This communication net is so well organized and so complete that often they are in a position to get this information through fast—when other means of communication fail or do not exist.

The Reconnaissance Troop

This is definitely your baby, and as a general rule in new divisions you will find the troop commander young, keen, but inexperienced and eager for help and suggestions. Ground yourself thoroughly before you start in the tactical principles of vehicular reconnaissance. (Captain, probably now Lt. Col., Brainard S. Cook of the 8th Reconnaissance Troop, has done a 23-page monograph on the subject which cannot be topped for clear and incisive thinking and excellent presentation.)

Again preach Indian tactics, ingenuity, alertness, caginess. Work him in his training, against your infantry intelligence personnel in two-sided problems. Never let him train on a dry run against simulation. Nothing dries up the reconnaissance mind faster.

Have him or his S-2 representative attend your S-2 conferences and your instructors' school. Be sure your infantry and artillery S-2's know the troop commander's job. Let infantry intelligence personnel ride with him on problems and have him and his men *walk* with the infantry enough so that they become thoroughly acquainted with infantry needs and are able to cooperate closely.

Get him to know Air. Fly him and his sergeants over his own problems when you can so that he may see them from a box seat and be better able to correct and criticize his troop's further training. Above all, give him opportunity for air-ground communication problems. Take his radio vehicles to the air field. Let his operators talk to and know the air observers and operators. Impress upon the ground operators that it is *their* job to tool the air in once it takes off, due to slight frequency changes incident to the take-off.

(Your signal company training can very well cover this same air-ground coordination).

The Quartermaster Battalion

Here you have drivers—88 of them to be exact—with a normal expectancy of a broad horizon of combat. After their qualification as drivers, they must go through the same intelligence school you have planned for your other drivers. Run the school yourself, if possible, with the cooperation of the quartermaster battalion's S-2 representative. These schools, being specialized schools, deserve your personal direction. They can all be five-day schools, afternoon only, on a schedule somewhat as follows:

1st Day.—Present the intelligence function and the divisions intelligence agencies. Stress alertness by dramatic means which show up general tendency of human beings not to see or hear what goes on about them.

2nd Day.—Map and terrain work—on the terrain.

3rd Day.—Orientation and map and terrain work from moving vehicles.

4th Day.—Distance judging, troop-group judging, vehicle-group judging, etc.

5th Day.—General tie-up. Examination (not written, but on terrain verbally).

Headquarters Company (MP's)

Forget the specialized work of this command; and in your school, which will probably have to be run piecemeal, treat the personnel as you would treat personnel of a rifle company—instruct it as you would instruct ordinary infantry intelligence personnel although the school need not and cannot be as extensive in scope.

The headquarters company should be especially well trained in camouflage discipline and in general counterintelligence discipline. The MP's who will handle prisoners-of-war should have their training pointed toward keen observation of these prisoners and simple deductions from their appearance and actions—not, however, their actual interrogation.

Preach simplicity in all your schools—stamp out the mystery of G-2-ism, the eyewash. Sell three things and three things only—

1. Look—and *see*
2. Scram—and *cagily*
3. Report—*accurately*

And if you have sold them well—and continually—you have done all you can to prepare for that dark night that lies ahead of all G-2's and all S-2's.

So don't have elaborate methods; have simple ones—and the simplest of all lies in disseminating intelligence training—*in words of one syllable*—to every officer and man in your division. Anything short of that is not doing the job. And if you have done the job, you can rest assured that you have done all that it is possible for you to do to accomplish your prime mission of safeguarding the lives of fifteen thousand men from enemy surprise action.

The Importance of Recovery and Salvage

By
MAJOR WILLIAM H. VAN DINE, *Quartermaster Corps*
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The contents of this article should be made known to every member of the Army.—THE EDITOR.

"Everything has a value in modern warfare . . . nothing should be wasted . . . nothing should be wilfully destroyed unless it is in danger of falling into enemy hands."

With this slogan in mind, we have organized during the past few months the most comprehensive salvage and conservation effort in our national history. Every day it is more apparent that this program will affect all Americans, civilians as well as the military, in our all-out effort to win the war.

It has been an accepted military fact for centuries that salvage activities save many millions of dollars in the cost of war. Every great commander in history attempted to organize an efficient battlefield recovery service. In the present conflict, economic circumstances as well as enemy action have had a direct effect on our activities. The supply of some vital raw materials such as tin and rubber has been cut off almost completely through military action by our enemies. The supply of others is definitely limited with the result that we must conserve them, ration them for civilian use, pick up every piece of scrap and turn it into proper channels for military use, and supplement them by finding suitable substitutes.

Under present conditions, the financial savings made possible by salvage and conservation activities are of secondary importance. More important are the savings in materials and production requirements, the relief afforded to procurement, storage and distribution, and the economy effected in overseas tonnage and shipping space of other transportation facilities.

While this article will cover only the salvage activities in the theater of operations and the type organizations designated to function there, similar activities throughout the Zone of the Interior are equally important. Actually, the great preponderance of our manpower and equipment is now located *within* the continental limits of the United States and our efforts here at home must be well directed, efficient and constant. We in the Army should be particularly careful to set the example for all to follow. We cannot expect the present civilian conservation programs to be successful unless we lead the way. We cannot be careless in our efforts and expect the average civilian to be efficient. He will follow our lead.

To understand the functions of the salvage service, one must be familiar with the meaning of the word. Salvage includes everything that is abandoned or no longer fit for use for its original purpose throughout the entire Theater of War. The fact that items have been discarded rather than their actual condition places them in the salvage category. For example: a new overcoat or a serviceable machine gun, if either has been abandoned, is classed as salvage. In the Theater of Operations, items discarded by enemy as well as friendly troops come within this category. They are classified as salvage until they have been made ready to be reissued.

Recovery Channels

There are two main channels of recovery on the battlefield:

I. The *maintenance channel* may be described as recovery made by maintenance personnel, mainly of combat units. They handle damaged or disabled vehicles and other heavy equipment requiring special tools or equipment. Every effort is being made to furnish the using arm or service with the necessary tools with which to effect this recovery.

The immediate return of damaged vehicles and tanks to their normal battle functions is imperative. Therefore, repair is made on the *actual field of battle,*

if possible; otherwise, *as close to the field of battle as possible.* This will be accomplished by the second echelon personnel of the using arm or service if they are equal to the job to be done. If they can't do the job, they will at least assist in the evacuation of damaged vehicles by placing them near the evacuation axis. There, medium maintenance units of the division ordnance take over and move the equipment either to their bivouac or other collecting points near the rear boundary of the division. In case it is impossible to perform the necessary repairs at this point, the responsibility for evacuation is transferred to the ordnance service of the Army or the Theater of Operations. As a general rule: *the item is not evacuated any further to the rear than is absolutely necessary.*

These damaged items are located by report, rather than by search. Oftentimes, the driver or another member of the crew is able to report the location of the disabled vehicle or equipment. If the crew is entirely wiped out, some other member of the using arm or service should make the report. The various echelons of maintenance in turn attempt to repair and reissue the item. If they are unable to do so they either evacuate it to the next higher echelon or report it to such echelon.

II. The *salvage channel* involves recovery by all troops other than those assigned to maintenance units. It is accomplished by a continuous search of all areas under the supervision of the type quartermaster organizations.

Normal Operations

There are six possible operations in normal salvage procedure. *Recovery* is the actual locating and taking possession of abandoned material. You have to find it before you can salvage it. *Evacuation* is the process of removing salvage to the proper collecting points and later to organized salvage installations. In these days of fluid warfare it is essential that the greatest possible speed be exercised in removing abandoned material from the battle field. Otherwise, if the battle flows in the wrong direction your salvage may shortly be in the hands of the enemy. *Repair* is the actual preparation of abandoned materials for reissue to the using troops. Salvaged articles are put into serviceable condition as soon as possible and as close to the front as possible. Repairs on the spot are often made by special operator or weapon crews. Of course, such repairs, limited as they are by the time and the tools available only attempt to put the equipment in usable condition for immediate action. *Reclamation* is the process of reclaiming any possible serviceable parts from an article that may be damaged beyond repair. Actual *Destruction* is sometimes necessary—this is normally resorted to only in the event that there is danger of the enemy capturing the material. However, if destruction is ordered it must be thorough and complete. Both the Germans and the Japs have proved themselves adept at improvising repairs on material which has not been completely destroyed. *Cannibalization,* i.e., the stripping of component parts from any disabled or salvaged vehicles or equipment, is a relatively new practice in the field. It may be practiced by all echelons. Non-repairable equipment will habitually be stripped before evacuation to the rear providing component parts are needed by the recovering unit. Even repairable vehicles may be stripped if there is a critical shortage of component parts in the echelon through which they pass.

Let us keep in mind that salvage will be classified and that its rearward flow will be directed as quickly as possible to the closest installations of the appropriate services.

Type Salvage Units

Now, let's survey the type organizations of the salvage service itself. These units will be found, normally, throughout the Theater of Operations. They really begin to function at the main salvage collecting point or salvage dump.

There are three of these type units:

I. The *Quartermaster Salvage Collection Company (T/O 10-187)* is charged with receipt and basic classification of all classes of salvage. This classification is done at salvage collecting points or dumps. It evacuates all quartermaster salvage to repair shops and depots. It evacuates salvage of other supply services to the proper installations maintained by the appropriate service.

The company is designed to handle the salvage expectancy for approximately 75,000 men. It is organized into a headquarters and three platoons. The platoon is the basic operating unit—one platoon will normally serve a division.

Transportation assigned to the company is sufficient only for its administrative, supply and mess requirements. Tactical units must utilize organic vehicles to haul salvage unless additional transportation is provided.

Specialists from the ordnance, chemical warfare and signal services are attached to the company. These men inspect and supervise the disposition of salvage of their respective supply services which has been turned in at the collecting points.

II. *The Quartermaster Salvage Repair Battalion—Semi-Mobile (T/O 10-236)* is designed to sterilize, launder and repair quartermaster items. It has an operating capacity of about 50,000 troops and will be located as far forward as possible. It will normally be in the intermediate or advance section of the Communications Zone. It is composed of a headquarters, a sterilization company, a laundry company and a salvage repair company. Its equipment is carried in semi-trailers but it must depend on securing sufficient vehicles to move its assigned personnel. The battalion is so organized that it can be split into two operating units, each of which can serve 25,000 troops.

III. The *Salvage Depot (T/O 10-250)* has as its mission the reclamation of all quartermaster property not reclaimed by salvage services further to the front. It is normally located in the base section of the Communications Zone and is a more permanent installation. If existing facilities permit, the depot should have about a dozen buildings. Whenever possible, shop operations will be supplemented by utilizing any local repair facilities. This may be done on contract by civilian shops or even by hand repair in workers' homes if conditions make this necessary. Regardless of the method of operation, local civilian labor will be employed to the fullest extent. The number of troops used in the depot will be kept to the minimum.

All salvage personnel must be prepared to destroy matériel in their possession upon receipt of proper orders to do so. As a general rule enemy equipment will be destroyed before our own. Fuel, motor transport, and other supplies which might be of immediate value to the enemy are given first priority in destruction. All troops should be thoroughly instructed in the proper method of destroying equipment which they are handling. If destruction is ordered, it must be thorough so that our enemies cannot repair and turn our equipment against us.

Chemically contaminated items which are found should be decontaminated by the recovering troops if they have necessary means. Otherwise, recovering troops will tag or mark these items and report their location to the Chemical Warfare Service for decontamination.

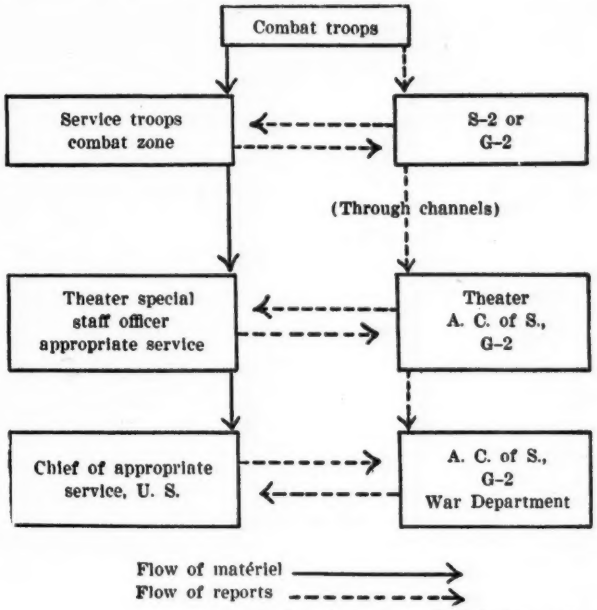
Enemy Matériel

The utmost speed is imperative as soon as enemy matériel of new design has been found in order that military intelligence can be brought into play at once. It is vitally important to utilize any new designs, any technical advances, or any inventions of the enemy; this is also important from a strategical and tactical viewpoint. New counterweapons might be needed, tactical plans might have to be changed or revised and provisions made for the eventuality of the capture of large amounts of similar matériel. Certain items will also enable us to make deductions as to the present state of the enemy's economic resources and his future economic potential.

As in the case of other salvage, these items are directed to the rear through their proper channels: e.g., Signal Corps items through Signal Corps Service establishments. It is the duty of all services to cooperate in guiding the movement in the appropriate direction.

Special efforts should be made to secure accessories, spare parts, ammunition and any essential information available and extreme care applied to prevent any damage. This rearward movement of the matériel should be paralleled by intelligence reports through command channels.

On its move to the rear the enemy matériel will pass through personnel of supply arms and services who should be on the lookout for any new types. As soon as any new type items are recognized as such, it will be delivered direct to the Special Staff Officer of the appropriate arm or service on the staff of the commander in the theater. Here again the move ment will be paralleled by a report to the G-2 of the command (See Chart No. 1).



(Reproduced From W.D.T.C. No. 81)

Chart No. 1.

Processing of Captured Matériel For Intelligence Purposes

After it reaches the Special Staff Officer, the item comes to its first definite stop. Here it will have to run the gauntlet of modern science and technology. Chemical and technical analysis are only the preliminary steps necessary for the compilation of all pertinent data. As soon as all data are assembled, preliminary manuals on operation and maintenance are made available. These manuals will contain all information to make the use of enemy equipment against its former owner possible. They will also list all United Nations parts, tools, fuels and other accessories to be used in its service and give detailed instructions on how to synchronize and coordinate its operation with the operation of our own equipment.

The Special Staff Officer who is charged with supervision and is responsible for all these activities will send a complete report to the G-2 on the theater staff.

By this time the item, or at least a representative sample, is on its way again and comes to its final stop at the chief of the appropriate arm of the service in the Zone of Interior. This movement is again paralleled by a report of the Special Staff Officer containing results of all preliminary investigations.

It is here that final conclusions from an economic, strategical and technical viewpoint will be drawn and final manuals on operations and maintenance issued. In the meantime, the timesaving device of preliminary investigations controlled by the Special Staff Officer has made possible dissemination of essential information to our combat units.

Cooperation Essential

All salvage activities in the field are performed under the supervision of officers detailed as Salvage Officers and functioning under the unit Quartermaster. The responsibility of salvage activities of subordinate units is vested in supply officers. It should be emphasized that collection of salvage is not a job limited exclusively to salvage units. Rather, it is the duty of all military personnel.

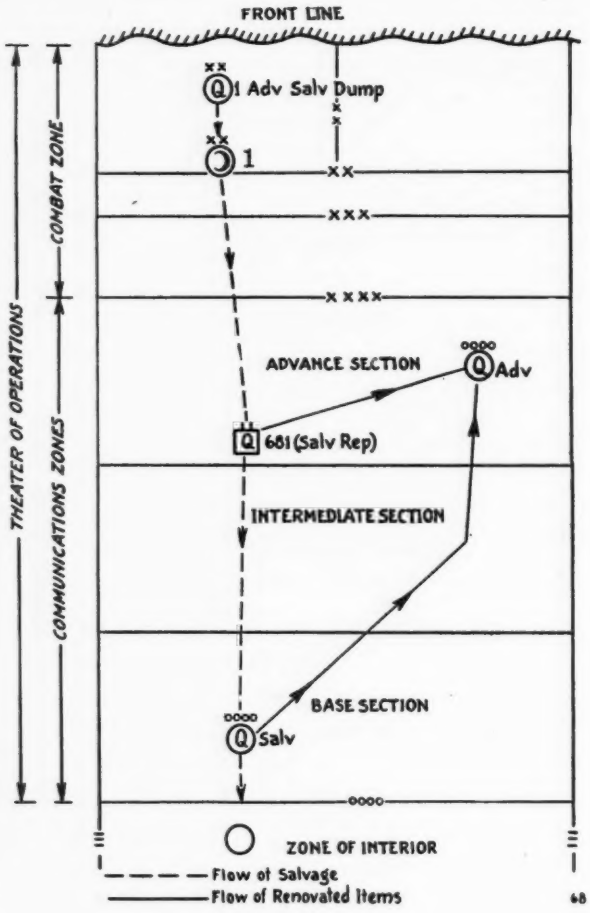


Chart No. 2.

Flow of Salvage (not to scale).

Administrative orders will designate collecting points, but every officer and man is expected to cooperate fully. By its very nature of organization, the organized units of the service cannot function efficiently without this assistance. In order to assure this wholehearted cooperation, it is necessary to explain the vital importance of salvage to every man who is or might become a member of a combat unit. He should also be indoctrinated with the necessity of detection, speedy salvage and examination of enemy matériel. Of course, it is also essential to instruct combat troops in the precautionary measures to be taken against booby traps and chemical contamination mentioned above.

Commanders of all echelons are responsible for proper utilization of available transportation for evacuation of salvage to designated collecting points. They are charged with the duty of collecting all abandoned property. They should see to it that every able man or prisoner returning from the front carries what salvage he can to the announced collecting points.

Salvage Flow

Speed in collection is essential. The quicker salvage items are recovered and turned in, the sooner they may be inspected, repaired if necessary, and reissued to our troops.

In order to illustrate the actual flow of salvage from the front lines rearward, we will assume that troops of an American infantry division have found a number of shoes, shirts, and rifles, which had been abandoned on the battlefield. The troops immediately turn these articles in at the salvage collecting point which has been designated in the Administrative Order. (See Chart No. 2)

As soon as possible, these items are sent on back to the main salvage dump. Normally, this dump would be operated by a platoon of a salvage collecting company with specialists from the ordnance, chemical warfare, and signal services attached. The shirts and shoes are sorted by regular personnel of the platoon and the ordnance specialists take possession of the rifles.

The salvage personnel carefully search all clothing turned in. Oftentimes valuable information may be found in clothing which has been abandoned by enemy troops. Care is taken to see that no ammunition remains in any pockets.

The ordnance specialists are responsible that the rifles are returned to either an ordnance supply point or to an ordnance repair shop, depending upon their condition.

It should be noted, however, that any of this material may be utilized for current needs at any point during its evacuation. For example, if the supply officer of the division needs any serviceable items which are turned into the salvage dump, they would be issued to him at once. No items of salvage are sent any further to the rear than is necessary.

The main salvage dump is cleared of collected items as quickly as possible. Any transportation going toward the rear may be utilized for this purpose.

The shoes and shirts mentioned in this example would be routed to the semi-mobile salvage repair battalion as shown on Chart No. 2. Here they are sorted according to their routes through the repair processes (See Chart No. 3).

The shirts are first sterilized in the sterilization section and then processed through the laundry section. After laundering they go to the clothing repair section. Those that are suitable for reissue are sent to the advance quartermaster depot. Any that are unfit for repair are baled together as rags and evacuated to a salvage depot.

The shoes are sent to the sterilizing section and then to the shoe repair section. Again, those fit for reissue are sent forward to the advance depot and the remainder are returned to a salvage depot.

Salvage depots have more extensive repair facilities than are to be found in semi-mobile battalions. They make every effort to renovate all articles sent in for repair and then return them to the nearest issuing depot.

Articles which cannot be repaired by the depot are processed for remanufacture by industries in the vicinity or if none exist, are returned to the Zone of Interior for use there if of any value.

Helps Win Battles

It is common knowledge that both the Germans and Japanese have placed great stress on capture of equipment of the Allied Nations. They have repeatedly had their salvage parties on the battlefield even before evacuation of prisoners of war had been completed. They are equally thorough in their measures to prevent their own matériel from falling into enemy hands. They have many efficient devices to insure quick destruction of matériel which is likely to be captured. They have often claimed that the efficient operation of their salvage activities has been one of the major factors in past successful compaigns.

There is no reason why our salvage activities should not be equally successful provided we realize that our type organizations cannot carry the burden alone. To function efficiently, our salvage service requires and demands the full cooperation of every member of our armed forces. It is vital that we use every means at our command to save everything of value and to return it to use as soon as possible.

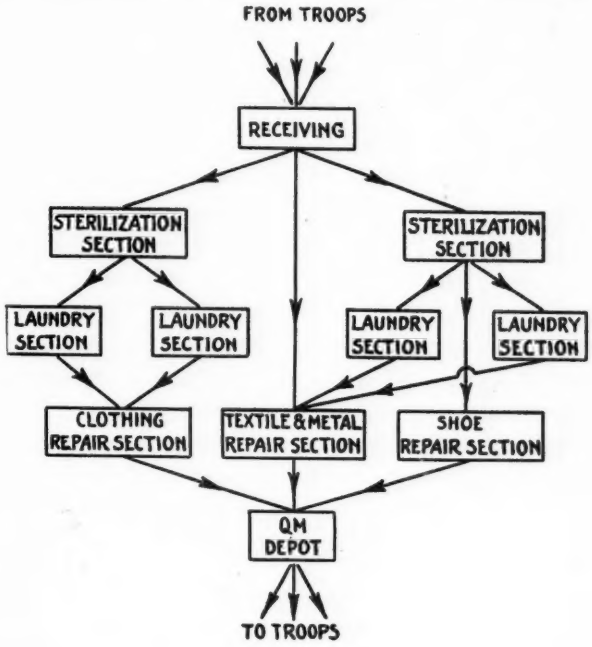


Chart No. 3.

Flow of Salvage Through Operating Unit of Quartermaster Salvage Repair Battalion (Semi-Mobile).

Armament also figures largely among conditions of success. The bravest soldiers with lances and swords could effect little against breech loaders and rifled cannon.

—*Nations in Arms, von der Goltz,* 1898.

Engineers in Cooperation with Infantry

Translated from the May 1942 Edition of *Bellona*, official publication of the Polish Army Headquarters, London, England.

A discussion and answer to this article appears on the opposite page.—THE EDITOR.

Extensive employment of technical equipment (explosive agents, armored vehicles, etc.) in combat has brought it about that every unit commander, from the squad upwards, is constantly confronted with the necessity of performing engineer tasks.

During the march, tasks of this kind may consist in removal of obstacles caused by the debris of night aerial bombardment; during offensive action it may manifest itself in the forcing of natural or artificial obstacles, removal of mine fields or capture of individual pill boxes. During defensive action the number of such tasks is multiplied to an even greater extent. In order that such tasks may be performed there is need for technicians more or less specialized, who cooperate *closely* and *constantly* with units in combat. It must be emphasized here that the *element of time* during which the tasks must be performed is fudamentally important due to the speed with which action develops, the need for erecting defenses against enemy armored weapons or, as the case may be, for clearing the way for our own mobile units.

The development of the organization of infantry units, which keeps pace with technical progress, provides them with the even more numerous and powerful means of combat. However, the number of engineer-specialists within such units who would be prepared to make useful employment of technical equipment and to counteract measures employed by the enemy is not increasing.

At this time the organization of infantry units is such that for each individual action, engineers or pioneers must be assigned to them as technical personnel. This system has a number of faults. It causes loss of time due to the need for the infantry to become familiar with equipment, strength and state of morale of the assigned engineer detachment, while the latter must become acquainted with the situation and mission it is to perform. Besides, it is difficult to anticipate what the needs may be for employment of engineer personnel and matériel. This system is not economical due to the fact that the need for constant transfer of engineer detachments for performing various missions decreases the effectiveness of their work because of additional marching, etc. The effort of engineer detachments is dispersed because they are unable to work entirely for one certain large unit or any of its parts. Likewise, this system is costly due to loss of highly qualified specialists who are frequently used on missions which may be equally well performed by non-engineer groups after the latter are given additional technical training.

These difficulties increase if tables of organization of large units and any of their parts provide for only small detachments of engineers or pioneers.

In this connection, infantry units, from the squad to and including the battalion should be made independent through addition of technical equipment and personnel. Enlisted men who have been given additional technical training could be called "infantry pioneers" or "technical infantrymen." Their number (at least 25% of the total infantry strength) must be wisely distributed, and such factors as difficulty of selection of suitable personnel, numerous missions to be performed, and losses must be taken into account. The pioneer platoon existing heretofore within the T/O of the infantry battalion should be reorganized into a stronger specialist platoon, equipped with special tools, anti-armored mines and explosives. Such a platoon should be capable of performing any special technical work.

In summing up, it is deemed advisable that

(1) each infantry squad should have one technically-trained man;

(2) in each platoon, in addition to the organic infantry squads, there should be a detachment of six technical infantrymen;

(3) in each infantry company there should be one squad composed of two six-man detachments of technical infantrymen;

(4) in each infantry battalion there should be a technical specialist platoon similar in strength and engagement to the engineer platoon.

Having technically-trained infantrymen not only will not reduce the combat value of infantry, but, on the contrary, will multiply it, for while performing the normal infantry mission, this personnel will also be used for special missions for which engineers or pioneers have to be assigned today.

Insofar as extent of technical tasks is concerned, these men should be prepared for

(1) planting mines and clearing mine fields;

(2) the use of explosives and flame throwers;

(3) facilitate overcoming smaller natural and artificial obstacles for the infantry, and

(4) the building of defensive works.

In connection with the above tasks there arises the need for supplying infantry platoons and companies with appropriate technical tools and equipment such as mine locators, explosive and incendiary agents and antitank mines.

The "Infantry Pioneer"--Panacea or Fallacy?

By

COLONEL CHARLES R. BATHURST, *Corps of Engineers*
Instructor, Command and General Staff School

This article is a discussion of and an answer to the article "Engineers in Cooperation with Infantry" which appears on the preceding page. —THE EDITOR.

Such articles as "Engineers in Cooperation with Infantry" and similar ones by various military writers usually emphasize the need for more pioneer or engineer training for the infantryman and then proceed to enumerate such elementary tasks as placing and clearing mine fields, overcoming small natural and artificial obstacles, and the building of defensive works. The article by the Polish author, however, goes one step further and advocates the inclusion of specially-trained technicians in infantry units from the squad to the battalion for that purpose.

It is believed that modern war demands that all soldiers, not just a specially-trained few, should be trained in the placing and removal of anti-tank mines, that all soldiers must have the pioneer spirit to overcome obstacles, and that knowledge of the construction of the simpler forms of defensive works should come under the head of basic training. There is no better way to start an argument than, for example, to tell an artilleryman that he cannot place his guns in a given position.

However, when it comes to the extensive use of high explosives—and the current war is one of high explosives—or the extensive use of other more technical means, it is hardly practicable to train such a high proportion of the infantry for such duties. If the percentage envisioned by the author is now included in the infantry strength, a little arithmetic will show an undue decrease in infantry combat strength and a disproportionate increase in equipment. If the percentage is added to the present infantry strength we would have a return to an unwieldy large unit cluttered up with special equipment. Furthermore, a uniform distribution of pioneer or engineer specialists is undesirable. The bulk of such forces must be kept free to move to meet the varying demands of battle.

Articles of this type do emphasize the need for combat engineers employed as their name implies and for the close association of engineers and supported troops throughout their training and service.

The current practice of attaching an engineer platoon to a combat team is sound. But it should be a constant attachment and thus each component of the team knows the others, their capabilities and their limitations. The situation is known and no time is lost in sizing up the situation. Then, if additional engineer strength is needed in a given situation, the additional combat engineers merely reinforce the engineers already on the job. The time element in reinforcing the engineer effort can be reduced by proper anticipation of the need and by the mobility of combat engineers who, in our army, are motorized.

The need for close cooperation between engineers and infantry reaches its zenith in the assault of fortified localities. Such an operation requires the best infantryman and the best engineer, not a jack-of-all-trades. And both must work as cogs in the assault team that includes artillery, tanks, chemical troops, and combat aviation. Such teams require highly-trained technicians, but each to his own speciality. Here again is the need for close association and combined training.

The Polish author is correct in speaking of the needs for aggressive pioneer training for all soldiers, but it must be remembered that we are in an age of specialization and that the system he proposes for engineer operations is impractical. Without a doubt combined training of all arms is essential if our armies are to have the support of modern engineer resources.

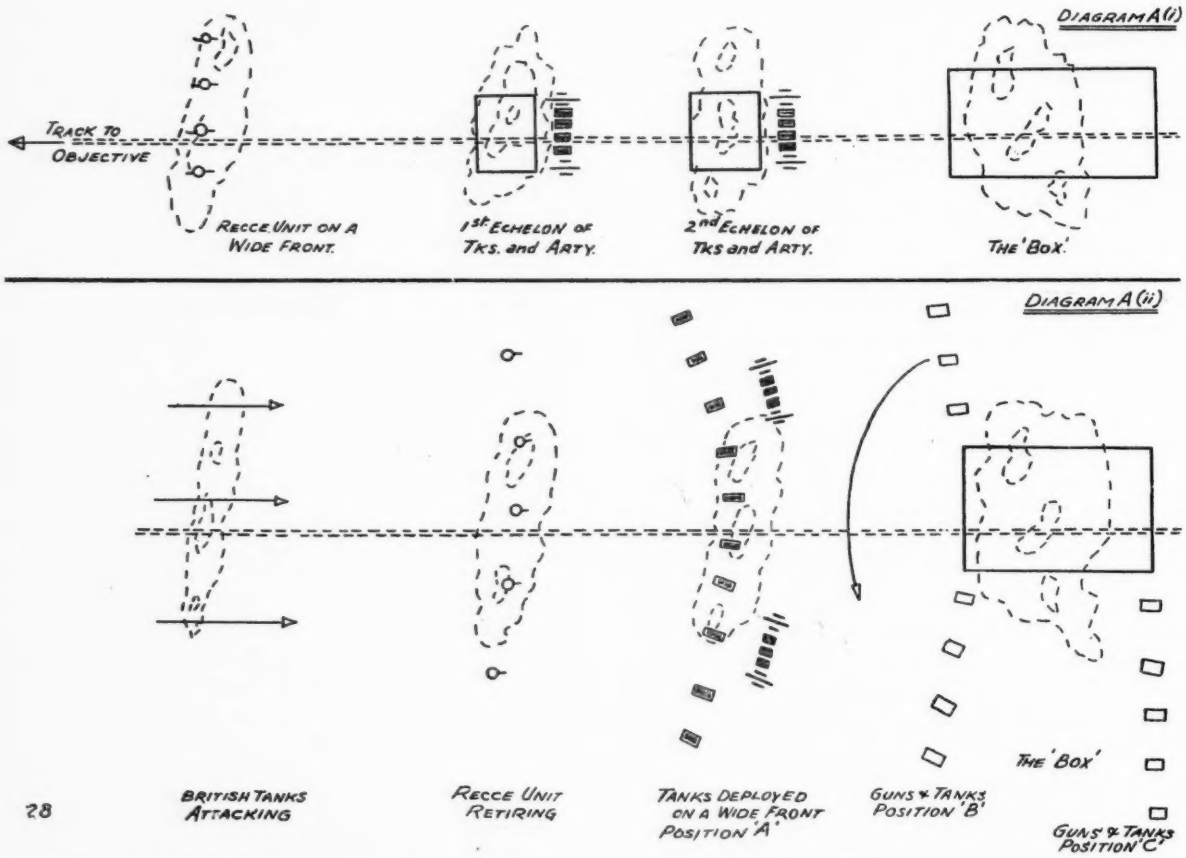
Advance and Attack

Methods of German Armored Units In Libya, 1941-42

By
COLONEL H. B. LATHAM, *British Army*
(Reprinted from *The Journal of the Royal Artillery* October 1942)

In connection with the handling of his armored units there are four principles from which the Boche rarely departs:

1. The primary role of the tank is to kill infantry.
2. The main weapon of the tank is thus the machine gun.
3. The tank can only be successful if used in conjunction with all arms.
4. Tanks must be used *enmasse*.



As a result of these views—

a He will not fight a tank *vs* tank battle if he can avoid it.

b The order so constantly given to our armored formations "to seek out and destroy the enemy's armor" has led to almost tragic results.

c His tactics are based on his armor always moving with other arms in close support in the form of a "Box" or moving "defended locality."

COMPOSITION OF THE "BOX"

The "Box" is the part of his column which is inside the dotted line in diagram "B." It varies in size, but if a battalion of tanks is moving with it, it might contain the following fighting troops in addition to the tank "ground crews," reserve petrol, etc.:

1 battalion lorried infantry usually carried in semi-tracked, semi-armored vehicles.

1 battery 50-mm Antitank guns.

1 battery 88-mm AA guns.

1 troop 150-mm close support guns sometimes on SP mountings.

1 battery field guns.

On the move or in the attack the artillery with the "Box" is disposed of as shown, i.e., the antitank and AA guns guard the flanks and front faces while the infantry guns and field guns are usually only inside the "Box" when it takes up a defensive position. In

size it is approximately two miles deep on a frontage of 800 yards. The 88-mm though it has proved a very effective antitank gun is primarily included in the "Box" to protect the "soft skinned" vehicles from air attack.

Method of Advance

The method of advance is shown in diagram A. On dead flat country the distances between the various portions of his column are approximate.

Between the reconnaissance unit and the leading echelon of tanks	5-10 miles
Between 1st and 2nd Echelons of tanks	1 mile
Between the 2nd Echelon of tanks and the "Box"	2 miles

The whole is directed towards some tactical feature which if seized will force us to fight and so engage on ground of his choosing.

In normal terrain each portion of his column moves from high ground to high ground and the more rearward echelons of the column step up rather like the old cavalry advanced guard. Each echelon of tanks is supported by field artillery which moves in rear of them.

Method of Fighting if Attacked on the Move

As soon as our tanks are reported to be advancing, the "Box" halts and takes up position for all round defense. This can be done very quickly owing to its formation on the move. As our tanks advance the Boche reconnaissance unit falls back and their two echelons of tanks deploy on a wide front with the flanks thrown forward as in position A, diagram A (ii).

If we continue to advance they continue the retirement to position B and force us to attempt to break through one flank.

If we imagine that we decide to attack the Boche left flank, this falls back to position C and our tanks if they pursue are not only engaged frontally by his Mk. IV tanks but are caught in flank by the antitank and AA guns of the left face of his "Box." Finally the tanks of the Boche right flank swing round and engage our attack in rear.

The artillery which moves with the tanks in the advance may either remain supporting them or enter the "Box" to stiffen its antitank layout.

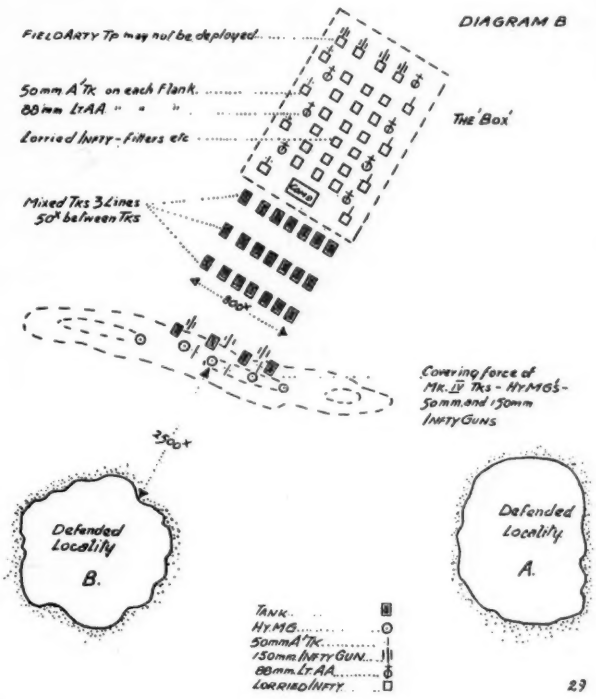
Attack Led by Tanks Against a Locality (Diagram B)

In general the Boche accepts our reconnaissance of the ground and aims at taking one of our localities. He realizes that it is usually impossible for an attack in depth to pass between two localities or to cross the front of one locality to attack another. His attack is launched therefore approximately "Head on."

Such an attack might thus be carried out in the following way:

Phase 1. He will reinforce his reconnaissance unit with tanks deployed on a wide front and drive in our covering force, until he is approximately 2,500 yards from our "Crust."

Phase 2. A most careful reconnaissance of our localities will then be carried out by a senior commander in a tank to decide which locality to attack. In Libya last winter when our localities were not necessarily sited on high ground a great deal depended on whether the Boche could get a position about 2,000 yards from our front face on which to deploy his covering force. In diagram "B" it is assumed that he has found this and is going to attack locality "B."



Phase 3. His covering force now deploys as follows:

Mk. IV tanks take up a hull-down position on the ridge and with the fire of their machine guns attempt to pin the defense. They may engage visible antitank guns with their 75-mm.

Under cover of their fire 50-mm antitank guns, heavy machine guns and close support 150-mm infantry guns are also deployed in an attempt to knock out the antitank guns of the defense or to kill their detachments.

It should be noted that in the British army since the Vickers machine gun has been withdrawn there is no means of engaging the heavy machine guns opposed to us except by the fire of field artillery. The majority of the weapons deployed by the Boche in his covering force are dependent on open-sight laying and so can be

blinded by smoke. Under cover of the fire of his own covering force the attack forms in rear thus:

1. Three rows of tanks about 50 yards apart and each row approximately 150 yards in rear of the one in front.
2. When the tanks are in position the "Box" forms up in rear as shown, the infantry all riding in their trucks.

Phase 4. At zero hour the whole moves forward at about 15 mph depending on the ground. As they pass through their covering force the tanks begin to fire not so much with a view to hitting anything but simply to have a psychological effect.

On arrival at locality "B" some tanks drive straight through to the rear face; others assist their infantry to mop up.

The latter do not usually dismount till they arrive in the locality when they fan out, using Tommy guns extensvely.

Phase 5. When the attack is successful the covering force moves forward into the captured locality to stiffen the defense and the tanks are usually withdrawn and serviced near what has now become the rear face of his locality.

CONCLUSION

(a) It takes 2 or 3 hours to prepare and stage such an attack.

(b) If successful no minor counterattack is likely to drive him out, for his defense is very rapidly organized since all the weapons he requires are immediately available.

(c) As a result of such tactics our localities have had to be sited on higher ground to avoid ground from which they can be overlooked.

(d) Such attacks are now being beaten off and it is apparent that in future they will not succeed without much more artillery support.

(e) The whole form of the attack has been reduced by the Boche to a "Battle Drill."

Check List on Instructional Methods

GENERAL

Is the time of day suitable for the type of instruction?

Is theoretical instruction augmented by practical demonstration?

Are practical examinations given wherever possible?

Is the supervision effective?

TRAINING AIDS AND CLASSROOM FACILITIES

Is the area or classroom used for two or more groups, resulting in mutual distraction?

Is the instruction being conducted near other distracting activities?

If instruction is held outside, are the students seated to the best advantage (backs to the sun, close enough together to hear the instructor, no trees or other obstacles to prevent the students from seeing the instructor, the instructor standing up-wind, etc.)?

If inside, is the ventilation satisfactory?

Is the lighting adequate?

Are suitable writing surfaces available for instruction requiring writing, plotting, arithmetic, etc.?

Are blackboards available to the instructor for explanations?

Are blackboards well-painted and clean?

Blackboards, charts, diagrams, etc., should be placed against a blank wall. If this is not practical, the windows adjacent to the blackboard should be covered to prevent light shining toward the students. Is this principle followed?

Are there proper seating facilities for all students and are they arranged for all to face the instructor?

Are the charts, diagrams, etc., large enough to be seen by the students in rear of the room without effort?

INSTRUCTORS

Is the instructor properly prepared for his period of instruction?

Does he make the instruction too academic?

Does the instructor digress from the scheduled subject?

Charts, diagrams, pictures, etc., which are used to emphasize or clarify a point or phase of instruction should be removed as soon as they have served their purpose. Is this done?

Does the instructor speak firmly and loud enough to be heard in the rear of the room without conscious effort on the part of the students?

Does the instructor write or draw on the blackboard large enough to be easily read by all students in the class?

Does the instructor know his subject or does he read from a manual?

HINTS TO INSTRUCTORS

Remember that men learn by all five of the senses, and by actually doing. The real test is, how well can they do it?

If you are to conduct a demonstration, practice several times prior to the class period.

Know what you are to teach and how you are going to teach it before coming to class.

Avoid profanity.

Never use obscene language.

Never talk down to the class.

Never decide that the student is stupid.

Do not try to bluff. If a question is asked and you do not know the answer, tell the students that you will find out out the correct answer and tell them later.

Remember that the instruction given has but one ultimate purpose—Victory on the Field of Battle.

STUDENTS

Are the students attentive?

Do they sleep or doze during instruction?

Do they smoke during instruction?

—From *The Field Artillery Journal*

Military Control of Non-Military Signal Communications

By
LIEUTENANT COLONEL G. H. PALMER, *Signal Corps*
Instructor, Command and General Staff School

During peacetime it is generally sufficient for the Army and Navy to concern themselves only with *commercial* communications in addition to their own military facilities, but in war time they must concern themselves with control and use of *all* forms of signal communications.

Under the term "Signal Communications" only those agencies which transmit intelligence by an electrical means are considered here. In its more general military use this term also includes messengers and visual means of communications.

Non-military communications include agencies which serve the general public and private communication systems which serve only particular activities. Systems in the latter group are operated by civilian agencies of the various echelons of government, by nongovernmental profit-making agencies, and by amateurs who are in the game for pleasure and who frequently serve the public without cost. All these types of communication agencies may under certain conditions be of military importance and subjected to military control. For what purposes should we want to control all or any of these many agencies of signal communication?

In peacetime, government policy and the interest and convenience of the public require that public utilities be subject to economic control by the civil government to insure competition, reasonable rates, and the availability of adequate facilities in wartime. In the case of radio stations there must also be technical control to prevent their interfering with each other or with foreign and military communications in both peace and wartime. Control of communications is also necessary to insure their best use in the preservation of life at sea and in other peacetime emergency.

The extent of economic control exercised is determined by domestic policy alone in the case of internal communications. International communications, also, could be controlled economically to some extent; but up to the present time, business relations between American-owned communication companies and foreign agencies with which they communicate have been left to mutual agreement without government interference. Technical control of radio, on the other hand, is exercised in such a way as to conform to international agreements. These agreements concerning radio are, strictly speaking, applicable only under peacetime conditions or between nations which have peaceful relations. Consideration of expediency alone will ordinarily govern wartime use of radio.

In peacetime our national policy permits unrestricted use of all the agencies of communication which have been mentioned within the particular field for which each is licensed. In peacetime only limited consideration is given to certain factors which in time of war become paramount. In war-time these communications agencies must be subject to the same control as in peacetime and also to certain additional measures.

In wartime every agency must operate in such a way as to render maximum service to the nation's war effort and a minimum of aid to the enemy. Communications agencies can greatly aid by giving important messages relating to the war precedence over routine messages, and there must be assurance that communication channels will not be interrupted by strikes, subversive activities, or any other avoidable means. Unauthorized radio stations are sought out and eradicated in time of peace, but in wartime efforts along this line must be redoubled to prevent communication with the enemy. There must be assurance that war message traffic does not become known to the enemy and that he does not intrude false messages into our communication system. Radio stations may serve as beacons to guide enemy planes to their objectives in our territory unless there is authority to silence all radio stations at such times. All these things demand that there be much close, government supervision of non-military communication agencies in time of war as to operating personnel, message traffic handled, and periods of operation and of silence.

Radio broadcasting stations must, of course, be closed in time of enemy raids just as are other radio stations, but at other times they should be used in such a way as to further the national interest. We frequently read items in the newspapers concerning the efforts of dictator governments to prevent their peoples from listening to foreign broadcasts. We will be much wiser if we take advantage of radio broadcasts in a positive way, to transmit special announcements of public interest and to raise the country's morale rather than trying to ban listening to broadcast stations of any nationality. Control of broadcast material must be exercised in such a way as to make the listener have more confidence in the reliability and completeness of information broadcast in the United States and allied countries than in broadcasts originating in enemy states. Unless this public confidence is maintained, the value of the broadcasting system will be seriously reduced and public morale unfavorably affected by listening to and believing statements broadcast by the enemy.

The first World War showed that a nation can be vanquished without any important invasion of its territory and with its army still active in the field. The first break of the Central Powers came in national morale, not on the field of battle. Radio broadcasting gives us a means of influencing quite directly the morale of enemy nations, and by so doing, shortening the war.

Such positive control of broadcasts, whether to bolster our own national morale or to destroy that of the enemy, is a civil function in the Zone of the Interior; but in a foreign theater of operation it will be a military job.

Negative control of radio stations of all kinds to prevent their serving as navigational aids to the enemy is a military function, both in the theater of operations and in the Zone of the Interior.

All the foregoing types of control measures may be necessary even though the county is not a theater of actual surface combat operations. Should surface combat actually come to our territory, whether from the air or from the water, more stringent measures of control will be necessary to insure the security of our own internal communications related to the war as a whole and to secure such service as these agencies can provide for military purposes.

At corps, army, and higher headquarters and in rear areas, it is absolutely necessary to have telegraphic and telephonic communication with subordinate, neighboring, and higher headquarters and activities. Distances are usually too great to be covered efficiently by messengers and liaison officers, and field wire will not give the required electrical communication. Even temporary pole-line will not always be satisfactory. There

must be substantial, well constructed, pole-lines. To build such lines takes time, material and manpower that can ill be spared during active operations. Fullest advantage must be taken of existing facilities, and measures of control must provide for full use of available non-military communication agencies.

Control can be exercised in a variety of ways and degrees indicated by the words supervision, inspection, control, use and closure, which are frequently used in various plans and directives dealing with this subject. We may take as the necessary minimum the economic and technical supervision exercised in peacetime by the Federal Communications Commission. This involves only the prescription of regulations and the necessary supervision and inspection to insure their observance. Normal management, whether commercial, private or governmental, retains complete operational control within the legally prescribed limits.

In time of war it may be necessary to take operational control, replacing normal civilian management by a military or specially approved civilian management, actual operations continuing to be performed by regular civilian personnel of the agency. A further step, to be taken in case of necessity, would be for the Army to make complete use of facilities by actually taking possession and operating them, using military personnel. The former method—management control—will usually be satisfactory in the Zone of the Interior to limit the effect of domestic disturbances and subversive activities. The latter method, complete military operation and use of communications, may be necessary in actual theaters of operations, especially in enemy territory.

In the first World War the only special degree of control exercised within the United States by civil or military arms of the government during the first year of our participation in the war was assumption by the Navy, in April 1917, of control of all radio stations. This was particularly necessary at that time as the commercial radio facilities for overseas communication were much scarcer than they are now, and there was reason to fear interruption of cables connecting the United States and Europe. In June 1918, Congress gave the President authority to take over telephone, telegraph and cable companies. Under executive order possession was taken of land wire systems in July 1918, and cable systems in November of the same year. Management of systems was in some cases changed to hake it more responsive to government control, operation in other respects being carried on by the normal personnel.

All these commercial communications facilities were returned to private control at the end of the war and have since been much improved and expanded. Today there are many more radio channels to foreign countries and overseas possessions than there were in 1917 and 1918, and there are more submarine cables. All these channels can be operated at a speed five times that which could be realized during the last war. At the time of the last war there were almost no entirely American-owned cables, but now there are several; so the situation as regards adequacy of international communications responsive to United States policies is not liable to enter into any decision as to the need for government control. Under the policy of limited economic control by the government there has also been a continuous growth of internal communication facilities since the last war so that at present there is no fear as to adequacy of either domestic or international communications facilities for wartime purposes.

The many amateur radio stations and broadcasting stations which did not exist at the time of the first World War now introduce new problems in communications control.

During the last war we also had experience in military control of non-military communications in enemy territory —in Germany after the armistice. It was found necessary to have military personnel on duty at all times in telephone offices, an officer being stationed in each of the large centrals. Local German employees were continued on both outside and inside telephone and telegraph duties. This German telephone personnel was forbidden to make changes in the switching facilities or at terminals without permission from the signal officer. In one case, in spite of normal warning, changes were made on the telephone main frame at Coblenz. The responsible party was given three months in jail for changing these circuits without permission, and making of unauthorized changes stopped.

A censorship board was set up, and all long-distance circuits were continuously supervised by able linguists assigned to this board. It was required that local inhabitants obtain permission to make long-distance calls. In each case they were told the restrictions on conversations before they were allowed to make a call. If they violated these restrictions during the conversation, they were immediately cut off.

The civilian population was allowed to make commercial and social telephone calls, but they were cautioned and warned that their calls were being censored at the switchboard. In some suspicious cases telephone circuits were checked continuously until suspicion was removed. All telegraph messages were censored. All censorship duties were performed under the intelligence section of the General Staff.

Control of communications in enemy territory in time of war is exercised in accordance with the laws of war and certain international agreements related to the Hague Convention. Under that convention, communication facilities in occupied territory may be seized even if they belong to private individuals, but they must be restored and compensation fixed when peace is made. Submarine cables connecting an occupied territory with a neutral territory may be seized or destroyed in case of necessity, but they must be restored and compensation made at the end of hostilities. The primary governing consideration at all times is military necessity.

Congress makes laws for control of interstate and foreign communications in the United States, while control of communication between points within each seperate state is left to that state. Radio communication falls under state jurisdiction only so long as signals emitted by stations do not affect in any way radio communications outside of that state. In view of the nature of radio signals, this means that there are no radio operations of any magnitude at the present time which do not come under the jurisdiction of the federal government.

Federal laws governing signal communications agencies are contained in the Communications Act of 1934 and amendments to that act. Under that act the Federal Communications Commission is the principal organ for the execution of federal laws and regulations concerning electrical communications within the United States. The duties of this Commission have to do principally with economic and technical regulation and supervision of the industry, functions which must be performed in both peace and war.

In addition to establishing the Federal Communications Commission and the basis for its operations, the Communications Act of 1936, as amended, also delegates to the President certain powers for use during war emergency. If he finds it necessary, the President may prescribe preference or priority for communications essential to the national defense and security. He may employ the armed forces to prevent any obstruction or retardation of communication, interstate or foreign, by radio or wire. He may suspend the peacetime rules and regulations governing communications and cause the closing of any wire or radio facility or station or authorize use or control of such a facility by any department of the government with just compensation to its owners.

Censorship of communications or signals transmitted by radio stations is specifically omitted from the powers of the Federal Communications Commission, but by a separate act of December 18, 1941, Congress authorized the President to establish a censorship of communications sent by cable, radio, or other means

of transmission between the United States and any foreign country. This power of the President is exercised through an office of censorship under a director of censorship advised by a censorship policy board which includes in its membership the Secretaries of the Navy and War Departments. Since censorship is not considered as a signal communications matter, it will not be discussed further here.

By an Executive Order dated September 24, 1940, the President established the Defense Communications Board to prepare plans for military and civilian use and control of radio, wire, and cable communication facilities. The board was specifically directed not to consider censorship.

Since December 7, 1941, the President has changed the function of the Defense Communications Board from simply planning to actual exercise of his wartime powers as defined in the Communications Act of 1934, and the title of the board has been changed to "Board of War Communications." In exercising the President's powers the board is governed by consideration of national defense and security, with minimum interference with needs of civilian government agencies, industry, and civilian morale and with provision for compensation to the owners of facilities affected. Unless otherwise specifically provided by the board, the normal management and employers are to continue in the operation of these facilities in the normal way. The board consists of the chairman of the Federal Communications Commission, the Chief Signal Officer of the Army, the Director of Naval Communications and the Assistant Secretary of State in charge of the division of international communications.

Up to date the Board of War Communications has taken the following actions:

By an order dated December 26, 1941, it gave the Navy authority to use, control, supervise, inspect or close radio stations on vessels, domestic and foreign, within the jurisdiction of the United States. This authority is necessary in connection with the Navy's control of all shipping in and near this country.

Orders of the FCC issued in December 1941 and February 1942 require radio stations to cease transmissions temporarily during impending air raids on notification by the Fighter Command which is responsible for defense against air attacks. This prevents radio stations serving as guideposts to the raiding planes. Authority given by this order to fighter commands was later passed to the defense commanders under whom fighter commands operate.

Under the scheme promulgated in this order radio broadcast stations are grouped into radio control areas within air defense regions. The information or filter center of the Fighter Command sends warnings of approaching enemy raids to certain key stations in the various groups. Each key station then transmits a prearranged signal, and all stations cease operations until released by the Fighter Command. In order to carry out this scheme, key stations are required to operate 24 hours a day. These orders indicate that control of non-military radio stations not specifically allocated to other government agencies for control or use continues to be exercised through the Federal Communications Commission under policies prescribed by the Board of War Communications.

The latter board in March of this year authorized the Secretary of War and the Secretary of the Navy to take measures to safeguard all military and naval messages handled by radio and wire facilities under the jurisdiction of the United States in order to insure their speedy and secure handling and to insure that no messages of spurious origin will be transmitted by these agencies. Under this order the Army or the Navy may, if necessary, require that persons suspected of subversive activities be removed from employment and be forbidden access to communication facilities. In exercising this authority, the Army has assumed jurisdiction over commercial wire facilities, including cables; and the Navy has assumed jurisdiction over commercial radio-telegraph facilities, both domestic and international.

So much for control of communications in the United States, where the Communications Act of 1934 applies and normal civil agencies are functioning. What of theaters of active combat operations—particularly foreign theaters? How shall we control communications there? To economize matériel and effort, existing commercial wire lines and military wire systems must be utilized to maximum capacity. In enemy territory all wire and radio facilities come under military control for use as needed. In friendly territory facilities are requisitioned or operated by normal civilian agencies under army supervision.

The degree of military control necessary in any friendly theater of operation depends largely on the degree to which civil activities have been disrupted and the military requirements for the use of nonmilitary facilities. In an actual combat area, operation by military personnel would be necessary regardless of whether the population was friendly or hostile; however, in the communication zone, operation by friendly civilian personnel under military supervision would be satisfactory for most purposes. In the Zone of the Interior, except in time of domestic disturbance, the present scheme of control through close cooperation between military authorities and civil management will ordinarily suffice. In time of domestic disturbance it may be necessary for military authorities to step in and actually take over and operate some or all communication facilities until tranquility is restored and reversion to normal civil management is feasible.

The manner and degree of control is likely to be different in each theater.

In North Africa there are not enough non-military communications to offer any problem in their control. On the island of Viti Levu in the Fiji Islands the population is friendly; so control of non-military communications there should not offer any serious problems except that the number of wire circuits existing there now, according to available information, is so small as to make them of practically no value to any task force called upon to operate there. In New Zealand would be found an equally—or more—friendly population as well as some facilities, probably, available and useful to a force which might operate there. Under such conditions control would probably be gained by cooperation with normal civil agencies controlling them except in areas actually occupied by the Army or Navy for military purposes. If France is invaded by the Allies in the face of German opposition, they will undoubtedly find the population friendly; but by the time fighting has moved back far enough to let them think about the use of non-military facilities, they will find that such facilities no longer exist, thereby eliminating the problem of their control. Perhaps instead we shall have to think of how to use military facilities for non-military purposes.

Conditions in France during the last war may be a guide to what can be expected now. In August 1914, as the Germans advanced rapidly through Belgium and northern France confidently expecting to use existing non-military facilities of Belgium and France much as they had used those in their own country during mobilization, they found that Belgian and French facilities had been thoroughly destroyed. As troops and headquarters advanced they soon outran the ability of military or impressed civilian agencies to construct new lines. Practically no radio had been provided; so the armies on the north flank of the German advance soon found themselves out of touch with each other and with GHQ. This resulted in a very serious lack of coordination in operations and contributed in no small degree to their failure to accomplish their objective. The Germans learned their lesson from that and changed their Chief Signal Officer and their scheme of signal communications. The Allies should not expect the enemy to leave any facilities as he is pushed back.

When American troops arrived in France in 1917 fresh from a country

where they had all the telephone and telegraph service that they wanted, they found that facilities available for long distance communications, either telephone or telegraph, were scarce. While French Posts and Telegraphs cooperated as fully as their facilities allowed, it was necessary for the American Army to construct its own long distance wire system extending from GHQ at Chaumount to all the various bases in France as well as to London.

The Signal Corps erected over 1,700 miles of permanent pole lines in France and strung over 22,000 miles of wire. The system included nearly 155,000 telephones connected to 400 central offices. At the end of the war the system was turned over to the French Government.

Suppose American troops were to make a landing in Japan. They might find a useful communication system there if they landed and advanced fast enough, but they could not depend on the civil population to operate it in a way favorable to us, and it would undoubtedly be necessary to take it over *in toto* and operate it by using military personnel—perhaps some of the WAAC's—that are now in training.

In Hawaii there arise still different conditions. Martial law was declared on the afternoon of December 7; on December 9 a general order was issued by the military governor placing all activities of the Mutual Telephone Company under control of the signal officer of the Hawaiian Department. This was for the purpose of insuring maximum use of facilities and stocks of supplies available. The Navy supervises transpacific radio while the Army supervises communications between islands.

Employees of communication companies are prepared to instruct patrons on what can and cannot be telephoned. A person desiring to call from Hawaii to the mainland must identify the person to be called and give a full account of the conversation to be held. If any names are to be mentioned, they must be given to the censors beforehand; and if any are mentioned that have not been submitted, the connection is broken immediately. Other phases of conversation are dealt with similarly, and there are certain standard subjects that cannot be mentioned at all. The Army maintains practically the same system of control over the inter-island radio-telephone system.

Night Operations

By
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Even the ordinary mind untrained in methods of war and limited in its knowledge of the characteristics of modern weapons and engines of war must realize the following statements of fact:

1. The tank is all-powerful if properly used in daylight hours, but it is cumbersome to use and blind at night.

2. The airplane is a menace to ground troops during daylight hours. It can deliver precision bombing from even high altitudes; it can effectively machine-gun and dive-bomb ground forces during daylight; it can spot movements of troops in open country; but it is relatively useless for this type of work when darkness falls.

3. The machine gun and artillery find their best use in daylight when visual observation is possible. These weapons are of little value at night in anything but static operations.

It may be truly stated that "in the night all cats are grey," and in the night, modern weapons of war lose a great deal of their value. Everything depends on the man: his training, his tenacity, his courage and initiative. In view of the foregoing, our Army and L.D.F. (Local Defense Force) units must place night training high in the list of essential work, and by constant practice and attention to detail fit all ranks to undertake this difficult work.

Advantages of Night Operations.—These may be readily summarized under four headings:

a. Introduction of surprise—an important principle of war.

b. Avoidance of observation.

c. Avoidance of hostile aimed fire from superior ground weapons and aircraft.

d. Avoidance of shock action of mechanized armored forces.

Man naturally looks to darkness during which the bulk of his forces can rest. He relies on security by various means—sentry groups, patrols, listening posts, etc.; and if these security measures fail, he is open to annihilation from the night raiders whose numbers he finds difficult to estimate and whose attack is so swift and unexpected that he has little time in which to arrange anything but an improvised defense.

The eyes of the defender's force are blinded by the darkness of night, and use of fires or any illumination will render night bivouacs an easy target; consequently, provided adequate precautions are taken to insure a stealthy approach by the attackers, it should be feasible to effect surprise.

It is possible to place a band of small arms fire around rest areas at night, but success depends on careful arrangements made in advance and also on successful operation of an alarm scheme.

The armored fighting vehicle is notoriously vulnerable at night. Its crews are small, and operations of the machines during the day make severe calls on the stamina of its personnel; cross-country movement over unknown country is difficult and dangerous for tank crews; their armor provides complete protection only against bullets, and given the sheltering cloak of darkness it is comparatively easy to destroy them by special devices (Molotoff "Cocktails" etc.) provided night raiders are sufficiently trained to enable them to get to close quarters.

The Disadvantages of Night Operations.—Night operations are difficult and dangerous unless troops are trained to such pitch that they have implicit confidence in their ability to maintain direction and approach objectives cautiously and as a result of experience in training, have implicit faith in their leaders. Only first-rate troops have any hope of success; inexperienced men are liable to panic and confusion. Plans for all night operations must be simple. Maneuver is difficult, control is limited and there is constant danger of confusion, apart altogether from the difficulty of distinguishing between friend and foe.

The Problem of Training.—There is no short-cut to proficiency in training for night operations. Success or failure of these operations depends entirely on

the skill of the individual, and one badly trained man can upset the most careful plans and cause more confusion and panic in the ranks of the raiders than in those of the attacked.

Elementary training should cover particularly:

Training of vision.
Training of hearing.
Direction finding.
Movement in darkness individually and in groups.
Efficient employment of short range and special weapons—Thompson gun, pistol, revolver, Molotoff "Cocktails," grenades, knives, wire-cutters, bayonets, etc.
Passing of messages and orders.
Scouting.

Methods of Training.—The foregoing presents problems all of which must be solved. The obvious question presented is: How is this training to be carried out? In the case of visual training, instruction can only be given *after* the individual soldier is proficient in the subject by day. It is advisable to start elementary training on well-known ground when the soldier can easily understand the difference in appearance, shape, and size of objects in the darkness. During their training it will be noted that all objects appear larger. Outlines assume unaccustomed shapes because details disappear. It is desirable to observe with the moon shining from the rear and also to locate the observer in shadow. As progress is made, training of hearing can be combined with visual training. In this phase of instruction the soldier can be taught that the silence of night makes sound audible for a long distance; consequently, the distance of sound is underestimated. Furthermore, it should be demonstrated that a scout can see better from the prone position and hear better with an ear close to the ground.

Training for movement can first be considered in twilight near barracks. Emphasis should be placed on methods of movement and selection of ground for silent movement. In this phase the soldier is taught that on hard ground he should advance the foot gently, place the toe on the ground first and then lower the heel, and in soft ground or grass, etc., he raises the foot clear of the grass and puts heels down first, then lowers the foot gently.

Training in direction finding should follow the elementary periods, and in this phase all lessons taught previously can be practiced. Direction finding should be carried out with and without compass, and here again it is most desirable that easy ground, well known to the soldier, should be chosen. In this way confidence will develop, and the trainee is systematically prepared for movement over difficult and unknown ground.

The good instructor will keep in mind that the sole purpose of night training is to enable the soldier to find his way over unknown terrain in darkness, to move silently, to avoid observation by the enemy, and to close with his enemy, destroy him and return to his rallying point. In addition, therefore, to the points already mentioned, emphasis should be placed on the following:

a. Avoid use of lights—they disclose position and may result in loss of surprise.

b. Avoid noise—fasten articles of equipment or any item that rattles.

c. Aim at silent, swift movement even when not on roads or paths.

d. Avoid movement on hard roads and use grass margins.

e. Collective movement; observe the man to the front—conform to his movements. This eliminates necessity for orders.

f. Pass information back quickly and silently.

g. Wear identification marks—white stripe on back or around both arms.

h. Practice rapid and slow crawling.

i. Practice crossing obstacles, wire, wooded ground, etc.

j. Practice falling.

k. Use special footwear where necessary—gym shoes, socks over boots; dispense with unnecessary equipment.

There is no short-cut to proficiency in this phase of military training. Preparation of a syllabus requires careful thought and proper knowledge by the training officer of the requirements of men in learning fundamentals. Individual training of the soldier must first receive consideration, and success or failure depends primarily on the care and forethought exercised in preparation and supervision of this training. Proficiency can be obtained quickly and interest sustained if competitions are carried out in scouting, observing, patrolling, direction finding, etc. Most instruction should be carried out at night, and herein lies the great advantage—military training can be combined with that of the L.D.F. with the result that Army units and L.D.F. units are afforded opportunity for cooperation with consequent beneficial results to both.

Night training has other advantages. It breaks the routine of constant daily parades; its novelty appeals to the soldier; it develops initiative and powers of leadership; it makes for physical fitness and finally, it insures that if time comes for action we will have units capable of deriving maximum benefits from darkness and using that darkness as a useful ally and not as a dangerous foe.

Before making a decision in regard to night attacks, a commander must give careful consideration to the following:

Weather.—Dark and rainy nights are best. They make movements and control very difficult but are most favorable for surprise. Bright nights with wind blowing towards objectives are least suitable.

Ground.—A study of details of night attacks indicates that in most cases of failure the fault lay in operations over difficult, broken country which had the effect of imposing great strain on the attackers and causing confusion by intermingling of troops and columns; whereas in open country, attacks have been more frequently successful. In other words, night attacks differ from those carried out in daylight because they depend on the power of darkness for concealment and protection rather than upon terrain features.

Training.—Troops must be thoroughly trained and disciplined.

Objectives of Night Attacks.—The following considerations are of primary importance in selection of objectives:

1. A limited objective should be selected.

2. The objective must be well defined and easily recognized.

3. Approach to the objective and the objective itself must be carefully reconnoitered in daylight.

4. The route should provide an area near the objective at which attackers can assemble prior to the assault.

5. Roads, fences, hedges, etc. leading toward the objectives are valuable as a means of maintaining direction.

6. The objective selected should, if attained, assist future operations.

Time of Attack.—The selection of time for attack depends entirely on the situation. If the objective is to be attacked and consolidated, the attack is launched in sufficient time to complete capture and consolidation *before* daylight. This involves careful preparation and accurate calculation of the time taken to march to the objective plus estimation of the time taken for capture and consolidation. In a raiding attack wherein the attackers may have to get back under darkness, the time taken will have to be considered before any decision regarding time is made. The basic consideration which governs a decision of this nature hinges on whether daylight or darkness is desired immediately after the objective has fallen.

Selecting Forward Assembly Areas.—This is the position where the attacking unit halts and takes up the formation to be used in the final advance. It corresponds closely to any assembly area ordered for a daylight attack except that, owing to darkness, cover is not an essential. The important point to remember is that this assembly area is selected as close to the objective as possible consistent with safety, as the further away it is from the objective the less chance

there will be of preserving order in the last stages.

Composition and Strength of the Attacking Forces.—Foot troops or cavalry (cyclists) are best suited of all arms to overcome difficulties of night attacks. Armored or motorized cavalry or infantry can be effectively used in operations requiring movement over long distances. It should, however, be remembered that surprise is liable to be lost by the use of any mechanical vehicles and that in any event dismounted action will have to be taken in final stages of the assault.

The problems to be solved, therefore, are:

a. How large should this infantry force be?

b. What support can be given by other arms?

Strength of the force employed depends on the same consideration applicable to daylight attacks, except that the element of surprise, the likelihood of getting close to the enemy without loss, and difficulties in control all point the lesson that a *minimum* force consistent with requirements should be selected.

Actual composition of the force will also depend on the situation. Specialists will be selected for specialist jobs. If the situation is one which demands the employment of demolition parties, troops trained in demolition work must be included. The important factors to observe are:

1. Include sufficient men and material to execute the task efficiently.

2. Include only men who are physically fit and trained in night work.

3. Appoint as commander a man who has specialist knowledge of the particular task in hand and who has experience in leading men at night.

Orders.—In view of the necessity for careful preparation in advance, warning orders should be given as speedily as possible to subordinate units after the decision has been made.

Apart from details normally included in a daylight attack order, the following points require to be covered for an attack in darkness:

a. A definite route for each column to the assembly area or line from which the assault will start.

b. Means of identification.

c. Means of guiding and assisting the command in maintenance of direction and contact.

d. A definite objective outlined in clear language for each element of the force.

e. Action to be taken by other troops not participating in the direct attack but required to give assistance.

f. Procedure to be adapted in case of success by attackers.

g. A rallying point in the event of failure.

h. A detail regarding arrangements for withdrawal and a general direction for withdrawal in case of a raiding attack.

Preliminary Arrangements by Commander

a. Reconnaissance.—As already indicated, careful reconnaissance is vital for eventual success. If at all possible, physical reconnaissance of the objective and the route to the objective should be carried out by a number of officers. The alternative is to make a study of maps, aerial photographs, patrol and intelligence reports and to make use of the knowledge of ground already in possession of the L.D.F. or friendly inhabitants. As maintenance of direction is difficult, preliminary reconnaissance should cover examination of ground for well-defined land-marks, obstacles and direction aids such as streams, rivers, ravines, etc.

b. Direction and Control.—The value of local knowledge possessed by L.D.F. personnel is emphasized. Naturally, the best choice is a man of officer or NCO rank because of his extra military knowledge and training. Compass bearings and connecting files are useful for maintaining direction and control.

c. Distinguishing Marks.—Once orders are received, arrangements must be made to insure that each man carries distinguishing marks as prescribed.

d. Troops — Food — Arms — Ammunition.—The good commander insures that prior to the march the men will be rested and fed, and that they will carry with them the "iron rations" necessary for sustenance during the operation. Only arms, ammunition and special weapons prescribed in orders will be carried, and selection of these depends on the task in hand.

Action During the Attack.—No text can prescribe exactly what should be done once the attack takes place. A night attack depends for its final success upon the initiative and courage of the small group. The following points should, however, be observed:

1. All ranks should know precisely what is to be done.

2. Silence in initial movement provides the chance of surprise.

3. Speed, dash and individual courage bring success.

4. The "small group" commander and his powers of leadership are of paramount importance.

5. Start the assault from positions as close as possible to the enemy.

Summary

The main guides to success in night operations can be summarized as follows:

a. Simple plans.

b. Limited objectives.

c. Surprise.

d. Care in preparation and reconnaissance.

e. Use of local knowledge.

f. Trained men.

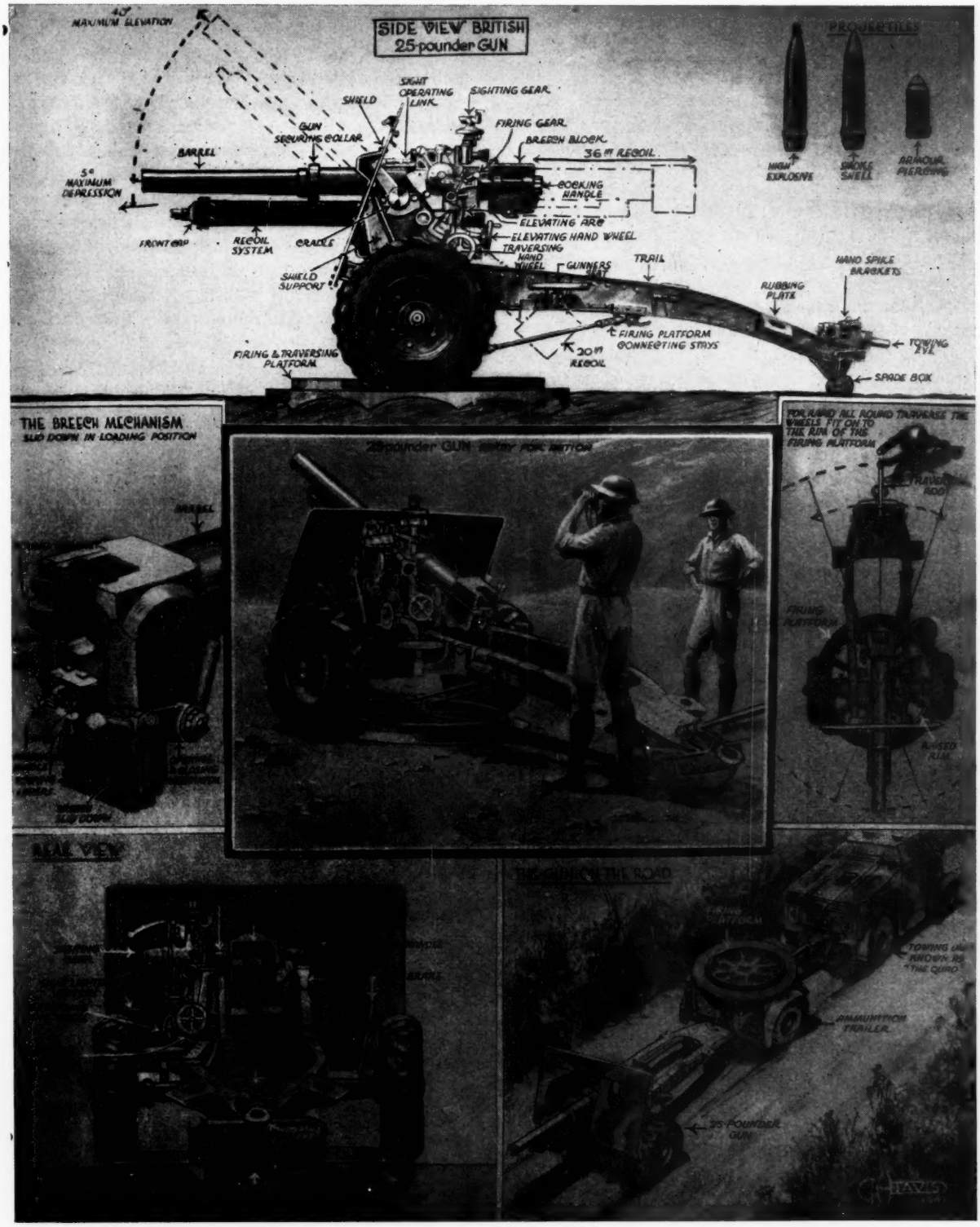
A Famous British Weapon and Its Methods of Working

(Illustrated on Page 63)

These explanatory drawings of the British 25-pounder illustrate its outstanding features and methods of transport and operation. The design of the 25-pounder allows for it to be swung in a rapid arc for antitank shooting, two parts specially designed for this ease of traverse being the wheel-like firing-platform and the boxed "spade" at the rear of the trail. The flange and track of the firing-platform are identical with those of the pneumatic-tired wheels, which thus swing the gun in a smooth circle, while the boxing of the "spade" has the double purpose of providing easy traverse over the ground and preventing the trail from embedding itself. With these facilities for quick changing of directional fire, correlated provision had to be made for stability; so specially designed platform-stays prevent the gun from moving on firing, all recoil being taken up by the recoil mechanism. The gun is operated by a crew of six men who are protected by a substantial shield and who have the benefit of very efficient sighting apparatus, including illuminating gear for night work. The 25-pounder is a quick-firing gun and employs three types of shells, as shown, fired by percussion, operated by a firing lever. The tapered barrel is 92.51 inches long and has a bore caliber of 3.45 inches. The breech is of the vertical sliding-block type—it is shown open for loading in one of our illustrations—and has provisions for automatic prevention of the cartridges slipping backwards during loading when the gun is at a high angle of elevation.—Extract from *The Illustrated London News* 5 September 1942.

The British 25-Pounder

DRAWN BY G. H. DAVIS, Special Artist of *The Illustrated London News.*



The Illustrated London News.

(See Page 62 for Text)

Officers and the Soldier's Mess

By
LIEUTENANT COLONEL EARLE D. BROWN, *Quartermaster Corps*
Commandant, School for Bakers and Cooks, Seventh Service Command

The following are extracts from lectures delivered by Lieutenant Colonel Brown on the subject of Mess Management before officer groups stationed within the Seventh Service Command.—THE EDITOR.

Nothing herein contained should be construed as a condemnation of all officers and all messes. I am meeting many fine officers whom it is a pleasure to know and a joy to serve with. Likewise, I have met many of the opposite type. I have seen many good messes, but few of them were as good as their officers seem to think.

I believe in an *esprit de corps* and its value to the unit. It is fine to sell your organization the idea, but just repeating over and over again that everything is in tiptop shape does not necessarily make it so. Many officers have relied far too much on the statement of the experienced leaders who say that an organization commander should develop high morale by telling the men over and over again how good they are. What these organization commanders fail to understand about such advice is that to make it work they themselves out of their qualities as officers must give to the organization those things that really and truly make a man proud to belong.

I doubt if there is an officer in the United States Army who, if he is doing all the things he ought to do, can find eight hours out of twenty-four in which to sleep. One thing most young officers and a sizeable group of older officers fail to understand is that the moment they accept their commission, they assume the position of an expert in everything. None of us have all the answers, but it is incumbent upon us when we do not know the answer to get it and get it quickly.

In the process of finding the answer, and developing yourselves as officers, you will come to one subject that merits much more attention and study than has heretofore been given to it by the average officer. I refer of course, to the subject of Mess Management. It is no less important to the well-being of your men and the success of our Army than the medical attention provided or the training for actual combat. I am not asking that you devote long hours to this function. It is not necessary. But it is necessary that you give to your mess twenty to thirty minutes a day of intelligent and understanding effort in solving its problems.

I am quite certain that most of us have at some time or other had the experience of witnessing an experienced inspecting officer at work. We were astonished that any one man in the very few moments it took him to walk down the line through the barracks, could see so many things. Sometimes it seemed as though the inspecting officer possessed super-natural powers; nothing seemed to escape him. If you were to ask such an officer the secret of his success, he would probably tell you that he saw what he was looking at. You, too, must develop the faculty of seeing what you are looking at. And in the process you will develop within your organization the feeling "do not try to put anything over on the old man; he sees everything."

For some reason officers have felt that there was something mysterious about the army mess, that only an expert trained in mess management could solve the many intricate problems. It must be for that reason that many officers inspecting a mess make a quick dash through the kitchen, listen only to the frequently meaningless palaver of the mess sergeant and observe only those things he wants seen. Officers seem hurried and most anxious to get the kitchen inspection over with and get out. They do not know anything about cooking or running a kitchen and, therefore, do not feel qualified to argue a point with the cooks or mess sergeant.

There is nothing mysterious about the army mess. Reduced to its simplest form, it means the converting of raw food stuffs, by the application of heat or cold, into a nourishing, palatable and well served dish for the soldier. You may not be a cook, but you have been eating food for a great many years, and I would hate to think that after so long a time and such a close association, you did not know which foods you like and the way you like them. Nine times out of ten, what pleases you will please your men.

Your association with dirt is of equal long standing. It dates back to the admonition of an exacting parent to "scrub behind those ears and wash your feet before going to bed." Dirt is dirt wherever you find it, on the soldier, his equipment, or in the kitchen. You will not stand for it in a rifle. Why stand for it in your kitchen?

Young soldiers are eager to do a job, but they do not know and will not know until they are taught. This means, then, that in newly activated organizations particularly, the company commander is frequently his own first sergeant, company clerk, supply sergeant and mess sergeant. He has to dig in and learn each of these jobs. Only by so doing can he teach them to others.

When it comes to breaking in a mess sergeant, as in everything else, the officer should realize that there is no substitute for knowledge or hard work. Acquire a store of knowledge; then you will have something to pass on.

I repeat there is nothing mysterious about an army mess. Do you know where the food comes from that you see in your mess? Are you acquainted with your unit supply officer? Have you visited the ration breakdown point to see how the ration is broken down for your organization? Do you know why there are substitutes in the field ration and what to do with the accumulation of unused supplies in your store room?

Get acquainted with your unit supply officer and commissary officer. They will provide you with the answers to these questions.

Do you inspect your mess just before meal-time? Are the mashed potatoes fluffy white or a dirty grey, lumpy mass? Is the meat sliced with or against the grain? It makes a big difference. Are the canned peas put on the stove an hour or so before they are to be served, or are they merely heated through? Is the soup made from a rich meat stock, or were various vegetables thrown into a pot, water poured over them, seasoning added, and the whole thing cooked for probably half an hour, thereby resulting in little more than hot water lacking flavor and body? Are the green vegetables bright in color, or do they have a dirty green appearance, indicating over-cooking and loss of nutritive value? Are hot rolls served frequently to tone up the meal, or is it always bread, bread, bread. Is the bread fresh or stale?

Some vegetables are less desirable than others from the soldier's viewpoint. Do you know which vegetables they are? Are they always served the same way, or do you suggest to your cooks various ways and ideas for fixing these vegetables so the soldier will eat and enjoy them?

Do your men complain that lamb is served too frequently? Do you know that seventy-five percent of the people, when lamb is properly prepared, cannot tell when they are eating lamb? Do you know what gives it the mutton flavor that so many people dislike?

Many soldiers do not like fish. Do you make it a point to see that your menu on fish days is sufficiently complete so as to insure every soldier a satisfactory meal, or is it a case where the soldier eats fish or goes to the post exchange?

Do your cooks complain about the lack of hot water and blame it for the greasy dishes? Do you know why there is not sufficient hot water?

Cooks frequently complain, when criticized because of tardy meals, that the ranges are slow because of a lack of draft. Do you know that coal and wood ranges have to be cleaned daily, inside and out? Do you know what the flues look like when they are clean and free from soot?

Is your kitchen infested with roaches and flies? Do you know that there are ways to exterminate or control them, and what those ways are?

When your kitchen police scrub the floors, do they change rinse water frequently and scrub and mop with the grain or against the grain?

The answers to these and thousands of other questions are yours for the asking. Consult *TM 10-405, The Army Cook,* and *TM 10-205, Mess Management.*

Do not be afraid of your mess. Take an interest in it and you will be most agreeably surprised at how easy it is to acquire mess knowledge and how quickly the mess will improve.

For some unknown reason many officers have concluded that messes will run themselves, food will be plentiful, and that if there is a shortage the civilian population will be rationed so that the Army can have all it wants. The Army is not entitled to all it wants. It is entitled only to that which it needs.

I assume that all officers are patriotic; yet there is much evidence to indicate that in some cases at least, the donning of the uniform constitutes the sole contribution and sacrifice for their country. For many months I have been preaching the gospel of food conservation, saying over and over again that food was fast becoming a critical item. Food is not plentiful, as we are now finding out, and will become less so as we go forward with our war effort.

As patriotic gentlemen, sincerely interested in the success of our Arms, we must wholeheartedly support the policies and programs laid down by those in authority.

Right now much of our canned goods, both fruits and vegetables, are restricted to over-seas use. That means you must see to it that all fresh fruits and vegetables coming into your kitchen are properly prepared and served to reduce to an absolute minimum the use of canned products. For the same reason we are asked to consume other meats as a substitute for pork and beef. The civilian population is being forced to do it, and we in the Army should do no less. All these things and many more need to be done to win the war.

Wherever possible, we, because of the high patriotic motives that prompted our entrance into the service, should set the example for all others to follow.

The Man Who Stopped Hitler

A Study of the Russian Soldier

By
RALPH PARKER
Writing from Moscow

(Reprinted from *The New York Times* 8 March 1942)

In Tolstoy's "War and Peace" Andrew Bolkonsky talked with Peter on the eve of the Battle of Borodino. "Victory" said he, "never can be and never has been the outcome of position, numbers or character of arms—least of all, position."

"Of what, then?" asked Peter, and Andrew replied:

"Of the feeling in me and in him"—pointing to Timokhine, "in every soldier."

You could travel very far searching for the spirit of the Russian fighting man—the senior officer, the subaltern, the soldier in the rank and file of the Red Army. From the craggy coasts of Rybachi peninsula near the Arctic, where, in bedouin-like robes of white, lonely watchers are on the alert for enemy convoys bringing supplies toward Petsamo, to the frequently contested heights of Sevastopol studded with pill-boxes, the front stretches 1,800 miles. Anywhere along the sinuous line you might find the men of the Red Army sniping from pine trees in the north, manning guns on the verge of a forest, smashing German blockhouses round Leningrad, turning across the bleak, swampy landscape to kiss the delivered soil of Russia, thundering on wiry horses from Orenburg across the beaten snow of the Northern Ukraine, waist deep in the icy waters of the Black Sea as they hoist supplies onto the shores of the Crimea.

But you need not leave Moscow with the front-line atmosphere to have a shrewd idea of what is in the Red Army man's mind—his convictions and the spirit which balked the Germans far more than their unpreparedness for the Russian Winter. In Moscow you see him in all stages of his development—the young recruit forming up untidily in suburban squares or flocking good-naturedly into parks deep with snow, the youngster who has become a veteran with deep-set eyes holding memories of the front as he walks through the city with a group of his comrades, the lieutenant at a ballet clasping a rifle between his knees in order to applaud each pirouette in "Coppelia," the political commissar with the frank expression of a good mixer who has snatched a few days between two engagements with the enemy in order to attend lectures in the capital, the wounded in hospitals recounting their experiences and impatient to return to the front.

Each of these soldiers has his own mental picture of the war's splendor and ignominy. One of them remembers a wheel of a German motorcycle still spinning after his shot had caused the rider to pitch forward dead. Another speaks of fresh snow settling on the faces of the murdered civilians he found at Rostov, of the monstrous havoc on the roadside, with disabled tanks lurching in ditches and staff cars belching documents in confusion. Another recalls the standard-bearer galloping down the lines with a Red banner when the regiment met with haggard partisans of Soviet Russia on the verge of villages where they had hidden from the enemy throughout the Winter in earth huts.

Here is a wide variety of personality and experience, with human material as varied in race as the Ukranian and the Turcoman—war experience as different as that of the men who, with headphones over their fur hats, control mine-detecting machines, and blood-stained Cossacks in the van of Timoshenko's southern armies. Yet out of all this it is possible to create the prototype of the Red Army's fighting men—that is, his character.

To begin with, he is essentially an ordinary Soviet citizen. There is no army caste and the traditions being formed are not of a kind that depart from what is to be expected of a fighting ex-civilian. Education under the Soviet has no different impress for a combatant and a non-combatant. This is true of the army in war as in peace.

The political staff of the army does more than arrange periodical pep talks. The army is taking its full share in military engagements, and it is the job of the political officer to broaden the mental horizon of the soldiers by keeping them well informed and explaining the reason for operations and the tactics employed.

The desire for knowledge on the part of the Soviet citizen, in or out of uniform, is the heightening of that burning curiosity which foreign observers since the seventeenth century have noted in Russia. It is apparent when you see how the Red Army man spends his leisure.

Like most young people in this country, he is the son of parents who were illiterate when he was born—80 percent of the Czarist Army in the last war were illiterate. He has the same eagerness to use the gift of literacy which he receives from Soviet education as causes the people of Moscow to stand in line for hours to obtain daily newspapers and to dawdle around bookstalls in the streets when temperatures are 40 below.

Illiterate Russia sought entertainment in music, story telling and dancing, so developing a strong tradition to which the young Soviet citizen is still faithful. The songs of the Red Army are often set to tunes that his grandparents would not have sung—jaunty catching little tunes that have been popular since the revolution. They are quatrain in form—"chastushky"—and they record current events with the spontaneous vigor of Calypso tradition. The history of the civil war is contained in these popular ballads.

Among the duties of young poets collaborating in regimental newspapers is writing ballads about the exploits of local heroes, which are not only sung in the army but find their way back to the rear, becoming the folk-lore of villages where the heroes are known.

Generally, however, the Red Army man spends his leisure educationally. His is a keen interest in technical questions, and if you ask Soviet tankist opinion of British-built tanks or a Soviet pilot on Tomahawks, he will speak with passionate interest, giving a detailed explanation of the merits or faults of the machines. If you ask the wounded soldier how it happened, he wraps up his personal story with an intelligent account of the operation, its aims and tactics. The Red Army's newspaper *Krasnaya Zvezda* (Red Star), which forms the basis of army lecturing, contains little of what the Anglo-American press considers entertainment. The history of various typical operations is described in technical detail.

Nothing is farther from the truth than the opinion sometimes heard abroad that Russian soldiers are of a simple, childlike character and blindly obey orders. Equally unfounded is the belief that the country's great resources of man power make the High Command extravagant in using troops. The single-mindedness of the Red Army man is not simplicity. He is alert-minded, with all attention focused on the aim of fighting, and his mind is clear of all doubts.

He is no less critical of the conduct of the war as he sees it in his own sector. The revolutionary discipline is founded exclusively on recognition of merit, and the superior officer is always exposed to critical observation.

Economy in using man power is fundamental to Soviet strategy. Extra stretcher bearers were brought to the front during the cold weather to speed up the transport of wounded from the battlefield, and doctors hasten to apply modern treatment at advance dressing stations, so saving countless soldiers from the knife.

Two anxieties which come naturally to any front-line soldier—how his family is faring and whether the home front is putting forth its full effort—are easily dispelled in Soviet Russia. In this socialist country people have come to accept it as natural that the state takes full responsibility in such an emergency as war for the welfare of the people, and though, with the present huge-scale evacuation, many families are out of touch with members, there is a lack of anxiety, caused not by indifference but by confidence in the authorities.

The Red Army man is gray-eyed with frowning brow, who smiles when he sees a chicken running frightened away from his tank, who is moved to tears when obliged to refuse a lift in the village the Germans are about to enter to the mother with two little boys clutching at her skirts and a baby in her arms; who is coldly tense as he mows down the enemy; to whom it is natural to tend a horse, sing a song, and enter a battle; who knows a little poetry—he likes to recite Pushkin—and remembers the song from the last film he saw; who expects a task to be set clearly by a commander he respects for his merits; whose sentiments are crystalized by simple things—a birch tree, the sunrise, a little child, a squirrel; who is a keen judge of character and a great admirer of personal courage. His curiosity is boundless.

"What do you think about when you go into action? a fighter pilot was asked.

"I am wondering what the enemy looks like and I like to get close to find out," was the reply.

The Russian soldier has great confidence in himself, and once he has learned the foe's methods he applies his mind to the problem of countering them. Now that the Germans have lost the capacity to surprise him, he feels that he is a complete match for the enemy. He is fighting as a patriot, defending his motherland as did the soldiers of Alexander Nevsky, Pojarsky, Suvoroff and Kutuzoff; and he is fighting as a Soviet citizen defending the Soviet way of living against Fascist reaction, with belief in a righteous cause as fervent as that of the soldiers of Pugachov and Razin, rebels against the Czars of old. He believes passionately, stubbornly, utterly in the values he is defending and restoring to the liberated regions.

The Confusion of Combat

There has been much written about leadership, an officer's conduct toward his men, the maintenance of morale, bravery, conduct on the field of battle and kindred subjects, but little if anything has been written on what an officer and especially one with little or no experience is to expect when he moves forward into battle.

It would seem that if these young officers and particularly leaders of small units were given a thorough insight into what to expect, a far more efficient handling of the situation would ensue in practically every case.

Here is the trouble: An officer is taught how to do things, how to lead his men, how to envelop this or that flank, when he is to start, what direction to take, what objectives to reach and so on; but did anyone ever tell him what he is liable to expect *en route?*

Did anyone ever try to prepare him so he would be in the proper frame of mind as he entered and during the battle, so that he would be able to meet the various situations as they occur, overcome them, use his resourcefulness? his initiative?

Did anyone ever tell him that practically nothing ever happens as he expects it will in war, that there is nothing but one new and unforseen situation after another to overcome and that is why he is there and why leaders are necessary? Did anyone ever tell him that this would be in addition to the order he has been given?

Did anyone ever tell him that the order might not apply when he arrives at a crucial point and that it will be up to him to use his initiative and judgment from that point on? Has he been told that there "ain't no" smooth-sailing streamlining in the company and platoon?

It would seem that if young, yes, and in most cases, older officers had the above firmly fixed in their minds before they came into the presence of the enemy and later went into action, there would be less breaking under strain, more officers capable of meeting the new and unexpected situations and less going back to "Blooey" and reclassification.

What is a battle, anyway, whether it be a big one or a small one, an army or a platoon or even a squad? Isn't it a moving situation from start to finish where the situation changes every minute, yes, every second, and what is correct procedure at ten o'clock may be absolutely wrong procedure five minutes later? Is not the enemy under the same strain?

After all, isn't it the side, great or small, that is able to meet the situation without going to pieces, that is more resourceful than the other, which normally wins?

If it were really known, in most cases young officers leading their platoons and companies would probably have done much better could they have been made to realize that practically nothing would go as expected, this or that squad would lose its way, ammunition fail to arrive as expected, half a platoon

wiped out by machine-gun fire, artillery fire or a bomb from the air. But most of all these young officers should know that the enemy is in the same boat. Things are going just as bad with him. He is having a hell of a time. These young officers should have constantly in their minds: "Now is the time for me to keep my head; nothing is going to stop me from going forward; this is what I have been taught to expect, and if I accomplish my mission no matter what happens I will be doing what is expected of me." Such is the state of mind the young officer should be in and all the I.Q. tests and psychological dissertations will not help him in the pinches.

Most civilians coming into the army forget one thing. They have, in practically all cases, been in positions where there was generally a normal procedure, where things went on more or less smoothly, with little upsets here and there, perhaps, to vary the monotony. Did they ever stop to realize that a big depression is much the same in many ways as is a big war? A big depression is a moving situation changing every minute. How many banks, large and small businesses go under? And the ones that keep their heads above water are, in most cases, the ones best prepared to meet any situation that comes along. And so it is in the army: the officers great and small (in rank, not stature) who are prepared, most resourceful, with the most initiative, who know the enemy is having just as much thouble and perhaps more, will be able to cope with the situation at hand, overcome the difficulties and come out victorious.

Battles are not like depressions in this respect. In the latter there are some rules governing the situation. But in battles there are no rules. Not any more. We are fighting an enemy who constantly hits below the belt; most of his blows are fouls and our young officer must learn to hit below the belt and often and know the enemy will do it every time.

In conclusion, it is believed that if at the various *candidate schools* the candidates were given instruction along the lines above stated, much benefit would be derived and they would go into the presence of the enemy with an entirely different mental outlook from what is generally the case. When one misfortune after another comes in the heat of action and everything is going wrong, a young officer will then not feel himself a failure but will know that this is what he must expect and, what is even truer, his opponent is having just as hard a time; and the one will win who has the most resourcefulness, initiative, perserverence, the one who is able to "hold on when there is nothing in him except the will which says to him 'Hold on.' "

A German Daylight Patrol

(Reprinted from *Training Bulletin No. MTP 8-30* Fort Benning, Georgia)

While the following article dates back to the final months of the first World War, it is still an outstanding example of a well conducted daylight patrol. It brings home the fact that the purpose of such a patrol is to get the information desired in spite of the resistance or obstacle that may appear at every turn.—THE EDITOR.

On 22 March 1918 the German 229th Reserve Infantry Regiment was participating in the German offensive which had begun the day before toward the west. After a considerable advance, the attack of the 229th was slowed down as it approached Saulcourt. The Germans were in contact with the English, but it was uncertain just where the latter would offer their principal resistance to a renewed attack.

A patrol consisting of a lieutenant, an ensign as second-in-command, one light machine-gun squad and one rifle squad was sent forward to determine the location of the new hostile main line of resistance. Machine-gun and minenwerfer fires by the regiment were to assist the patrol.

The patrol moved forward about 11:30 AM in a suitable formation. Upon nearing A it came under fire from a machine gun (as indicated) and suffered two casualties, the leader being killed. The ensign then took charge, and not wishing to become involved in a fight, he withdrew the patrol to the rear. This action was facilitated by the covering minenwerfer fire which was placed on the enemy machine gun.

The patrol crawled forward again after a slight detour, and near B surprised and captured two enemy sentries. It continued forward, advancing down an old trench. Heavy fire was then encountered from the direction of C. The patrol leader showed his map to his men and ordered them to move back, individually, some 300 yards, then move south across the road and assemble in the vicinity of D. This was done. Hostile fire continued on the area which the patrol had just vacated. At D the patrol leader could see that the English held Saulcourt, but it did not appear that the town was occupied in force. He noted that English outposts were advanced directly east of the town but did not extend far to the southeast since he could locate no enemy near D. The patrol leader, taking great care to avoid hostile observation, then moved his patrol to the small woods at E.
east. The attack succeeded with slight losses.

Discussion.—The above article ascribes success of the division's attack in large part to the leading of this one patrol. The paragraph of the German Infantry Regulations with which the article dealt reads as follows:

From E he could see small English detachments on the southeast edge of Saulcourt, while directly to the west of the town and 600 yards in rear, he observed strong hostile forces digging in. The right flank did not extend far south of Saulcourt. The patrol leader imme-

diately returned with his patrol to his regiment. The patrol had been gone two hours. The leader reported that Saulcourt was held by an English outpost, while the main line of resistance was 600 yards in rear, and that there seemed to be a gap in English defenses south of the town.

Based on this report the division attacked without delay, making its main effort on the south, only a demonstration being made against Saulcourt from the

"Reconnaissance may never be omitted during battle. No difficulties of terrain and no exhaustion of troops or leaders should cause it to be neglected.

"Careful reconnaissance requires time, but it is nevertheless without value if the commander is not informed at the right moment as to its results."

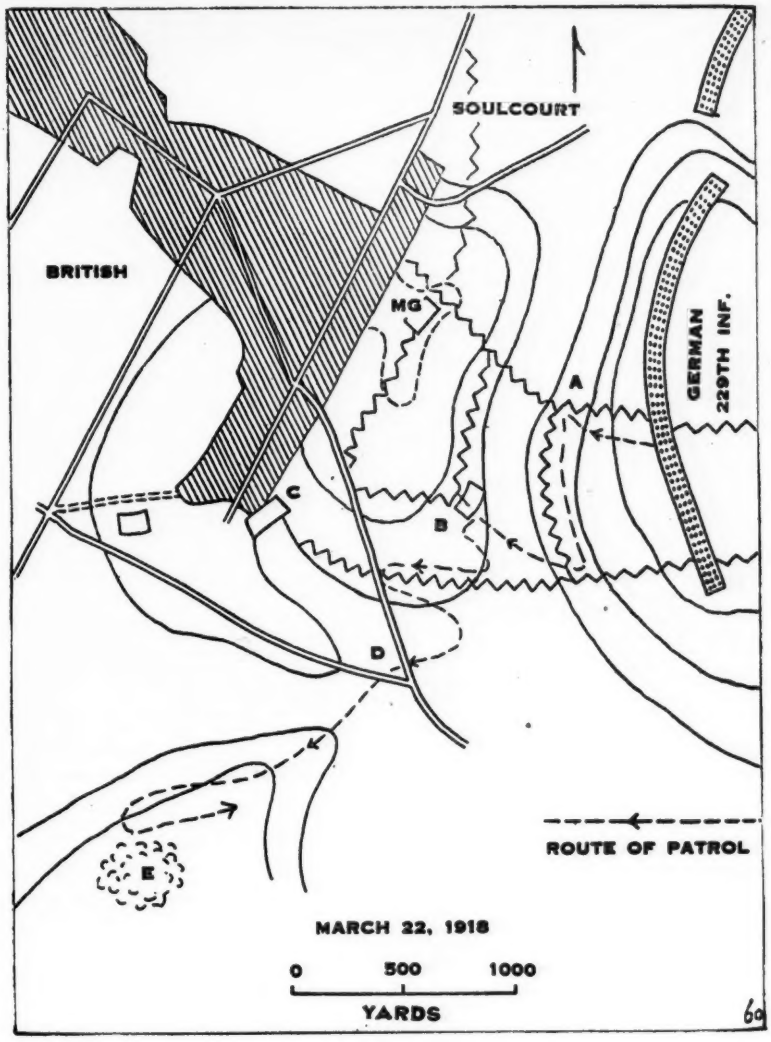
Points of interest in the leading of this patrol are as follows:

The patrol was led with vigor and determination. Having encountered resistance at several points it moved back in each case and tried elsewhere. It did not become involved in a useless fight nor did it permit enemy outposts to prevent it from accomplishing the mission of locating the British main line of resistance.

The fact that there were no British near and east of E, although negative information, proved of decisive importance.

The patrol leader got his information back promptly—in time for the important data he had obtained to be immediately exploited.

Information is of no value if it does not reach the proper commander in time for him to use it.



Foreign Military Digests

Digests of articles from foreign military periodicals; other items of interest from foreign publications are summarized in the Catalog of Selected Periodical Articles.

Supply Service on the Tundra Along the Arctic Ocean

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article in *Die Panzertruppe* June 1942.]

Resourcefulness is the one factor which often decides the outcome of a battle. When fighting in unusual terrain, such as the tundra—the treeless plain characteristic of northern Arctic regions—resourcefulness assumes added importance. The foregoing article illustrates some of the problems confronting an army engaged in the far north and requiring maximum resourcefulness from all ranks.—THE EDITOR.

It was a busy day on the tundra. The mountain troops had been engaged in heavy fighting which, hard as it had been, had been mastered.

Ammunition consumption was very heavy. All supply columns worked day and night to bring the required amounts of ammunition and fuel. The supply route which was used in this traffic started from nothing. When supply troops were first engaged on the tundra, they were faced with almost unsolvable problems: no highways, no roads, only boulders and rocks, lakes and swamps; no natural cover through forests, no towns, no houses, no native population. In short, it was a dreary land in the far north!

At that time advancing troops could only be supplied by means of hundreds of porters. Not till the first paths were beaten were pack animals and light, horse-drawn wagon columns engaged; later, when a solid road and then a highway were built, they in turn were replaced by motor vehicles. In the construction of this supply route, many thousands of men were employed who were furnished by construction battalions, the Reich's Labor Service and also Finnish construction troop organizations. However, the highway possessed one weak point: a bridge 200 yards long whose use was governed by strict traffic regulations.

It was, therefore, a busy day on the tundra. Cloudless sky, perfect flying weather and good view of the terrain. Even in the morning several low-flying enemy planes had attacked hurrying supply columns. In the afternoon, however, about eighty bombers appeared, both English and Russian, and dropped their loads. The fuel supply station was hit by eight of the bombs, but a few of them were not on the target. By quick work on the part of the officer and men at the station, a fire and explosion were prevented. Order was soon restored, and issue of fuel continued. In the meantime the enemy bombers had continued their flight along the supply route. Suddenly the roar of the explosion of hundreds of powerful bombs was heard in the direction of the only bridge. The bridge itself was not hit but the steep banks of the river were loosened for several miles, and many tons of boulders, clay and soil plunged into the foaming water. The bridge disappeared in a few minutes and with it the only supply route to the division was interrupted. The task of supplying the troops again became a serious task for the division supply commander. To be sure, he had supplied them with ammunition and food for four days, but the bridge could not be repaired in this time. The engineers required at least twelve days. It was utterly impossible to wait that long; therefore construction was first begun with a narrow foot-bridge. In thirty hours it was ready!

Truck columns were already standing ready on both sides. On the near side of the bridge, some 300 carriers picked up the needed supplies, carried them across to the other shore and loaded them on waiting trucks. This tiresome movement of supplies went on continually. After three days' time, however, the foot bridge had become unserviceable on account of the swampy nature of the ground. Because of wise foresight, however, a second foot bridge was already under construction and was soon ready.

Thus, daily, in addition to ammunition supplies, hay and oats, the men carried across to the other side:

50,000 portions of meat.
22,000 portions of bread.
20,000 liters of fuel.

Promptly at the end of twelve days the newly-constructed supply bridge was opened for travel and supply service continued in its regular course.

For us supply troops it was the joy and satisfaction that men in the front lines had not noticed the loss of this bridge—a sure proof that supplies of ammunition, fuel and food were adequate.

The Vulnerable Aircraft Carrier

[Reprinted from *The Aeroplane* (British) 19 June 1942.]

Aircraft carriers are vulnerable craft. Suspicion evoked by the high percentage of loss among British aircraft carriers is confirmed by the still higher rate of loss of the Japanese in the engagements off Midway Island and in the Coral Sea and by the United States loss of the Lexington. The Japanese had one carrier sunk in the Coral Sea and four off Midway. In two and a half years of the War, the British have lost four. To reply that all British and most Japanese carriers were sunk by land-based aircraft is to evade the main point. One immediate check on that argument is the fact that the Lexington was damaged by carrier-borne aircraft—so badly damaged that she blew up later.

In sea warfare beyond range of shore-based bombers, the carrier is theoretically capable of protecting herself by a combination of fighters, artillery and maneuvers against enemy air attack. The loss of the Lexington seems to deny the theory; and the reason is easy to find. The Japanese were stronger in carriers than the Americans. Fighters have relatively short duration, and a mere novice in air warfare would know the value of delaying his main attack on a carrier until the fighters were about to land; consequently, both opposition and evasion were reduced to the minimum. At some time in a sea battle the carrier is always likely to become a fairly easy target.

The real test of the carrier's power of self-defense will only come if the Americans and Japanese should eventually fight a big sea battle out of range of land. And if the Japanese continue to fritter away their carrier strength in such dangerous invasion work, they will be outmatched in carriers when the true trial of strength takes pace. The carrier is always in the dilemma of having to choose between fighters for protection and bombers for offense. The inevitable compromise may gain or lose in effectiveness by the quality of air reconnaissance on which wise employment of available aircraft depends. Knowledge of enemy movements at sea is more important than it ever was, because of the speed at which a situation critical for the carrier, and therefore for the reconnaissance system of a whole fleet, may develop.

So serious would be the loss of air support to a fleet at sea that reliance on a single carrier is apparently no longer thought of. The multiplication of carriers in Japanese fleets off Midway Island is not necessarily proof that the Japanese hold this view, for the Japanese intention was to use those carriers as forward bases for bombers and fighters to support an invasion; but one result of that battle will probably be to create a demand that an ocean fleet shall be supplied with at least one extra carrier for which the bombers must search before battleships, cruisers and destroyers can close in and use their guns. Indeed, unless the big ships soon succeed in engaging each other in the Pacific, there would seem to be grounds for prescribing a whole fleet of aircraft carriers as the desirable answer to Japanese naval strength. Then a massive air defense could go hand in hand with heavy air offense against surface vessels.

One other important conclusion which has emerged from the Midway battle is

that pattern bombing is still a power in operations against ships. The prowess of the dive bomber has been too often and too loudly proclaimed. Much too rarely has there been testimony like that of the naval officer who took part in fighting off the Norwegian coast in 1940. He estimated that only one bomb in every 500 found its mark in those days. The odds may have shortened a good deal since then, but they are still quite long; and the American Army bombers off Midway helped to restore the balance by showing that a bombing pattern properly arranged cannot be escaped by any normal maneuver of a ship.

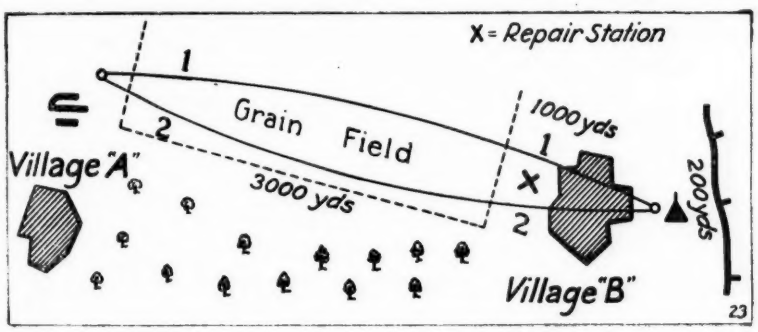
Said Col. Walter J. Sweeney, leader of a squadron of Flying Fortresses which hit a Japanese carrier, "If we can get enough airplanes for attacks like these, nothing can escape us, since we can lay bombs in patterns which no ship can avoid." To that should be added the remark that no Fortresses were lost in that attack. The devotees of the dive bomber will be wise to allow themselves second thoughts.

Battery Telephone Lines on a German Front

[An article which appeared in *Artilleristische Rundschau* April 1942. Translated from German at the Command and General Staff School, Fort Leavenworth, Kansas.]

Many details and self-evident facts are discussed in this article. It has been shown, however, that even such things must be thoroughly thought out beforehand, or just at the crucial moment the connections between observation post and battery will fail.

The situation: Firing position located about 500 yards to the left of village "A"; observation post, about 4,000 yards ahead on a direct line in front of village "B" behind our own front line. A grain field about 3000 yards long lay between firing position and observation post, reaching to the near side of village "B." Ahead and to the right, orchards extended between firing position and rear edge of village "B." Village "B" was under heavy fire at times from guns and trench mortars of small and medium caliber. The front rows of the village streets were exposed to machine-gun fire from the enemy from a vantage point in the hills which lay ahead. Medium caliber artillery shells and aerial bombs fell over the grain field.



Two lines had been laid between observation post and firing position, separated by an interval of from 300 to 500 yards in order that if one of the lines failed, the other might still function. For the sake of speed the two lines had originally been laid on the ground at night with aid of a compass and ran straight from observation post to firing position. Hence, they had originally run across the unobstructed grain field and across village "B."

Unfortunately, it became apparent that we had continuous trouble with this sort of line, and it took too much time to find and repair the trouble.

The lines were constantly subject to trouble where they crossed through village "B." In the beginning it was impossible for any one to go from the observation post in search of trouble during daylight hours, as the terrain was totally open over this area. Therefore it took a long time for repairmen leaving the firing position to find and repair any trouble in view of the great distance between observation post and firing position. In addition to this we at first had absolutely no idea just where the trouble was along the lines. In order to do away with this undesirable condition, we finally established a permanent repair station at the rear edge of village "B." Two pieces of apparatus were permanently cut into the lines here. When a line went out of order, it could be ascertained whether the trouble was in village "B" or in the open field. In case the former location was the seat of the trouble, repairmen were able to reach the damaged place much faster than if they had had to come all the way from the firing position. Too, after we had constructed a trench for protection it was unnecessary for any one to set out from the observation post in search of trouble, for movements were now possible over this stretch during the day. This permitted reduction in personnel at the observation post, an advantage which should not be underestimated in view of the great danger at this point and the usually limited quarters in the post. It was also possible to couple the lines at the repair station so that when, for example, line No. 1 from observation post to repair station was out of order, yet it was in order from repair station to firing position; and in the case of line No. 2 the connection between observation post and repair station was in order but was out of order between repair station and firing position, then by coupling together line No. 2 between observation post and repair station and line No. 1 between repair station and firing position, a good connection could be obtained.

We soon found that in village "B" a great deal of trouble occurred early in the morning and evening when the lines were broken by the heavy traffic of dispatch riders, units engaged in supplying food for the men, changing of forces and all sorts of other vehicles. In order to overcome this trouble, we raised the lines clear of the ground wherever possible. At the same time we were fully aware of the disadvantages of elevated lines. We knew that cable which is clear of the ground is more endangered by bursting shells than cable laid on the ground and that it is harder to work on elevated lines in exposed places than where lines are laid on the ground. It soon became apparent, however, that the trouble resulting from gun fire in the case of elevated lines did not reach the proportions of the trouble resulting from gun fire in the case of lines laid on the ground when disturbances arising from traffic were added to the latter. In addition, raised lines showed the following advantages: cable laid on the ground was pressed into the ground by traffic where it passed over soft roads and village squares. It was then difficult to find the separated ends and pieces, especially at night, particularly when one stops to consider that a great number of cables crossed and recrossed in the village, all of them being more or less damaged. On days when there was a great deal of trouble in the lines this latter situation led to an excusable but none the less disagreeable mix-up of cables. If one of the repairmen found a piece of his cable missing, he naturally began pulling at some of the other loose ends lying around. If he succeeded in pulling out a long piece, he put it into his line. Whether this was a lost piece of cable belonging to his line or whether it belonged to some other line was not easy to determine on account of the speed with which the repairman always had to work, and at night it was even more difficult.

It is obvious without explanation that none of these conditions existed in the case of raised lines. Too, in the case of raised lines, the various conductors were better shielded from one another and conversation was more intelligible, something which was very much to be desired in view of the great number of repaired places (as high as 30 per 1000 yards) and the insulation which was none too good. Matters would have been very bad in the case of cable laid on the ground when freezing weather suddenly set in. As could be seen in the case of other cables, the latter were frequently frozen on or in the mud, an entirely impossible condition, especially when it is considered that it would be impossible to pick them up undamaged in case it were necessary to move observation post or firing position.

When we again moved our cables, we saw to it that they followed a route as little exposed to enemy view as possible and so ran through streets of the village which had been proven not to be the object of enemy fire. We ran the cables over two routes which were entirely separated in order in this way to obviate the danger that both cables would be put out of commission simultaneously. Incidentally, it should be noted that it cost not a little trouble and a great deal of search before two routes could be found which met the requirements as closely as we have stated them.

There were disturbances in the cables running from the rear edge of the village to the firing position on account of enemy artillery and aerial bombs. We were not

able to escape this difficulty by shifting the cable, but this was not urgently necessary, since such disturbances were relatively few. It was much more unpleasant at night when heavy vehicle traffic moved in every direction across the field. In this way hundreds of yards of our cable were often torn loose, dragged away or crushed into the soft earth. It was then much harder to find and splice the ends which were lying around somewhere in the field than in village "B" where at least the houses prevented the cable from getting too far away. It would have been no use trying to raise the cable here, for at night even the poles would have been run over and broken by the vehicles. We decided, therefore, in spite of the increased length of the route, to run the cable to the right and through the orchards already mentioned. Here it was protected against vehicles.

We found that the shortest route is not always the best for a cable, but under certain circumstances a route which may be considerably longer is less risky from the point of view of gun fire, offers more protection against traffic and is less exposed to the enemy. Neither time nor pains should be spared in selection of cable routes, and the same consideration should be given to this matter that is given to the selection of observation posts and firing positions. For of what use are the finest observation posts and firing positions when the connection between them is not functioning and fails at crucial moments?

It is absolutely necessary, if everything is not to be in a state of continuous confusion, to name the lines: for example line No. 1, line No. 2, Battalion line, Radio Detachment Line, etc. Even the wires must be marked in some simple manner at every station, for instance, line No. 1 has one knot, line No. 2, two knots, etc. It is recommended that this designation should be recorded in writing at every station because time and again, in case quarters are crowded or there is a change in personnel, the different lines are mixed up. Until such markings are made, it has not happened only at first but repeatedly that repairmen got hold of the wrong wires in their haste and repair was delayed, to say nothing of the effort wasted.

We stationed our radio detachment about a hundred yards from the observation post, which was an advantageous position for them and would not betray the presence of the observation post in case they themselves were discovered. Thy were connected with the observation post by a short branch cable.

How the City of Yukhnov Was Captured

[An article from the Red Army newspaper *Krasnaya Zvezda* 6 March 1942. Translated from Russian at the Command and General Staff School, Fort Leavenworth, Kansas.]

The battle of Russia has brought into practice many innovations in field tactics. The absence of a rigid front line, after the pattern of World War I, and the fluidity of both offense and defense have caused both sides to construct their defenses around strongly fortified points of resistance. Cities, towns and even small populated localities have been transformed into strong points of this type. They have been found capable of offering prolonged resistance to the advancing enemy, who, if unable to capture such a strong point by a frontal attack, proceeds to by-pass it and occupies the surrounding localities. An example of action of this type is illustrated in this article, describing a battle which took place in central Russia during the 1941-42 Soviet winter offensive.

—THE EDITOR.

This morning, 5 March 1942, our units by a swift blow threw out the German occupying forces from the city of Yukhnov and captured it. This is a new victory for our armies which continue to press the enemy westward.

The Germans regarded Yukhnov as one of their strongest centers of resistance in this region. They even began fortifying it during the battles for Kaluga. Already having felt the power of advancing Red Army units and seeing that they would be unable to hold Kaluga, Medyn and Myatlevo, the enemy attempted to create a defensive line in the region of Yukhnov. They did not succeed in creating such a line. The Germans failed to anticipate certain things. For instance, their plan did not foresee a speedy advance of our forces south of Yukhnov. Advancing Soviet units captured Meshchovsk, Mosalsk, Sukhinichi: i.e., cities on the line which the enemy intended to consolidate for defense. The enemy also did not think that our forces would capture the city of Kirov. In the meanwhile the Red Army captured Dorogobuzh, which prevented the Germans from forming any kind of a defensive line here. All they retained was several points of resistance the center of which was Yukhnov, which was blocking our advance to the west and served partly as protection for Vyazma from the southeast.

These are the reasons why the enemy attached such importance to Yukhnov and was holding it with such tenacity. The Germans did not hesitate to lose other neighboring localities and were forced to weaken other sectors, but they continued to hold on to Yukhnov.

This also explains the exceptionally severe nature of the battles for Yukhnov. At first the Germans tried to offer resistance on the approaches to the city but in spite of their determined defense of populated, fairly strongly fortified points, the enemy failed to hold them. During recent days, battles took place around the city and in places on its outskirts.

A characteristic feature of the battles for Yukhnov is the systematic grinding up process of enemy personnel and the destruction of his matériel. The German command had reinforced the Yukhnov garrison and strong points east and souteast of the city. The Germans were throwing in all of their reserves available nearby, including local security units, specialist troops, etc. Our forces, however, were moving forward slowly but with determination and were gradually destroying these enemy replacements. It can be asserted without fear of error that the battles for the city have cost the enemy several thousand killed and a great amount of matériel and other equipment. That this is a fact may be judged by the results of battles for a large center of resistance situated on the approaches to Yukhnov.

This point (a village) was defended by a German regiment. It was blocking the road to the city, and the Germans were fortifying it with all their strength. Our units undertook their first offensive action at night. It began by heavy artillery fire on the enemy fortifications, and when the enemy firing points at the eastern limits of the village were partly destroyed and partly silenced, advancing units attacked the enemy. Artillery accompanying the infantry continued to destroy nests of enemy fire while lead was poured from automatic weapons on enemy fortifications, pinning down the enemy infantry inside. Advancing units occupied the edge of the village, but here they encountered strong enemy fire. In this engagement the enemy left 260 dead, four guns and 12 machine guns.

Towards noon the battle flared up with renewed vigor. The enemy moved up reinforcements in the strength of about two companies and six tanks and counterattacked. The counterattack was led by tanks, but two of these were immediately disabled by our artillery. Intense Soviet fire pinned the enemy infantry down to the ground. Thereupon our infantry strongly attacked with the bayonet. More than one hundred German bodies littered the streets.

However, in spite of heavy losses the enemy continued to hold part of the village. During the night one of our battalions went around the village and cut the road over which German reinforcements were moving up. Towards morning this battalion attacked the enemy from the rear while other Soviet units were attacking from the front. After a short engagement the Germans began to throw down their arms and ran in all directions. Here they lost an additional 110 soldiers and officers killed.

After this center of resistance was captured our units emerged directly near Yukhnov, but here the enemy had strong fortifications. The advancing force, having met resistance, was delayed. It was decided to by-pass the city. After several days our units succeeded in placing Yukhnov under pressure on three sides. Intentive battles continued by day and night. Our units continued to decimate enemy infantry. During the first days the enemy attempted counterattacks, but almost all these were repelled with heavy German losses.

German power was being dissipated, and the only thing enabling the enemy to maintain themselves at Yukhnov was the strong fortifications and defensive fire which continued with some power.

Yesterday our units struck against the city simultaneously from several directions. The blows were so swift that the Germans were unable to offer any kind of serious resistance.

The battle was very short in the city and took place only in a few sectors. Attacked suddenly, the Germans speedily retreated abandoning great amounts of matériel and supplies.

Crash Technique

Russians Ram Axis Planes

[Reprinted from the *Air Forces News Letter* May 1942.]

One of the specialties of Russian airmen in their battle against the German air force is the tactics of ramming enemy planes. The sacrifice of a dying pilot in a damaged plane by a deliberate collision with his foe is a relic of the first World War, but the Russians have developed ramming as a definite tactic from which both pilot and plane may escape undamaged.

Ramming was developed by the Russian airmen after they observed that frequently German multi-motored bombers escaped after being hard hit and seriously damaged by Russian pursuits. Often the pursuit pilot scored heavily, killing part of the bomber's crew and disabling one or more motors. However, these attacks usually exhausted the pursuit's limited ammunition supply, permitting the bomber to limp behind its own lines. Ramming is designed to destroy these crippled planes. It takes a combination of skillful piloting and utilization of the crippled victim's lack of maneuverability to execute a successful ramming operation with a minimum of damage to the attacking pilot and plane. More often the attacking plane is damaged and the pilot bails out.

Three Methods

Soviet flyers employ three types of ramming according to Major N. Denisov in a recent US.S.R. Embassy Bulletin. The most dangerous is the direct blow. Hitting the enemy plane with a part of a Russian plane and clipping control surfaces by slight propellor contact are also used. The latter method calls for the greatest skill and offers the best chance of survival.

Major Denisov points out that the propellor clipping method calls for an approach from the rear with the attacking plane's speed adjusted to that of the enemy. As soon as slight contact is felt the attacker may drop away to avoid crashing with the enemy plane as it falls. If the ramming flyer is too slow he may easily become entangled with the stricken plane and be dragged down with it.

American Air Forces observers abroad report numerous examples of the Russians' ramming tactics and there are accounts available from Soviet flyers who have rammed German bombers and made successful landings. Here is the account given by Junior Lieutenant V. Talakahin who was awarded the order of Hero of the Soviet Union for his exploits:

"On the night of 6 August 1941, when fascist bombers made one of their attempts to break through to Moscow, I was ordered to take off in my fighter and patrol the approaches to the city. I soon spotted a Heinkel 111 at an altitude of about 15,000 feet. Swooping down I managed to get on its tail and attacked.

Russian Describes Attack

"With one of my first bursts I put the bomber's right engine out of commission. The plane banked sharply and set its course for home, steadily losing altitude. I continued to attack the enemy and gave him about six bursts following him down to about 7,500 feet when my ammunition gave out. What was I to do? I could have followed the bomber farther but that would have been useless. With only one engine it could still fly quite a distance and perhaps escape. There was only one thing to do—ram the enemy.

"I decided to chop off his tail with my propellor and opened my throttle. Only about 30 feet now separated the two planes. I could clearly see the armor plating on the bombers belly as I approached from behind and below.

"At that moment the enemy opened fire with a heavy machine gun. A searing pain tore through my right hand. Immediately I gave my plane the gun and the whole machine, not just the propellor, struck the bomber. There was a terrifying crash. My fighter turned upside down. I unfastened my belt and drew up my feet, crawled to the opening and threw myself overboard. For 2,400 feet I fell like a stone, not opening my parachute. Only after I heard the roar of my plane to one side did I pull the ripcord. I landed in a small lake and made my way to shore."

Landed Plane Safely

Pilot Michalev of the Soviet Fleet Air Service was credited with ramming a Heinkel 126 in one of the first appearances of this new German aircraft on the Russian front. Mikhalev dived on the bomber after exhausting his ammunition. His propellor ripped the Heinkel's stabilizer and rudder. A flying piece of wreckage struck Mikhkalev on the shoulder but he managed to bring his plane down safely. The Heinkel crashed and burned.

Pilot Vinogradov did his ramming in the old-fashioned way. Fighting a single Nazi bomber over a vulnerable Russian target he exhausted his ammunition without getting a decisive hit. Meanwhile a bullet punctured his gas tank and his ship burst into flames. Vinogradov hurtled into the Nazi bomber and both planes were destroyed.

Another Soviet pilot who rammed and lived to tell about it is Alexandrovich Kiselev. He escaped with only a scratch on his cheek after bailing out. His plane was lost.

"It didn't come off so well," said Kiselev describing his ramming. "I am sure it is possible to ram an enemy ship without losing one's own machine. I was a bit excited and I suppose that is why I muffed the job.

"My ammunitin ran out. The enemy had hit my oil tank and radiator and my engine was just about giving its last gasp. I didn't want to let him get away so I went at him from below to get at his tail with my propellor. It was possible to calculate the movement so as to clip him with the tips of my propellor. But a stream of oil messed up my windshield and I couldn't see very well.

"Just as I was approaching him the suction of the air whirls caused by the Nazi plane swept my machine upwards. I got mad then and rammed him from above digging into his left side. I knocked my face against my stick. If I had figured it out properly that wouldn't have happened.

"The enemy plane disappeared. My own plane went into a spin, I tried to pull out but it was no use. I took my feet off the controls, stuck my head outside and was knocked back into my seat by the air blast. I pushed off with one foot, counted to eight, ripped and floated down."

Lieutenant Katrich of the Soviet Air Force relates another ramming incident:

"At about 10:00 AM I was told that an enemy plane had been sighted heading for Moscow. I took off at once and soon spotted a vapor trail at about 18,000 feet. The enemy was above and ahead of me. I put on my oxygen mask and picked up altitude. I drew up to within 300 feet of the Nazi plane. I sprayed him from stem to stern. It was only then that the Nazi crew noticed me. The cabin gunner returned fire. I gave them another long burst until I saw flames streaking from their port engine. After the third attack my ammunition gave out and their tail gunner was silent. The left engine was burning but the plane continued to fly. The pilot was apparently counting on my fuel supply being exhausted. It was then I decided to ram him.

Thought of Ramming

"I had thought a lot about ramming. The first reports of ramming by our flyers interested me but in most of them the planes had been lost. I thought it would be possible to ram without sacrificing one's own plane and here was a chance to test my theory.

"I approached the bomber from the left of its stern and aimed my nose at its

tail, calculating my attack so as to clip its stabilizer and rudders with the tips of my propellors. My calculations proved correct. There was a slight jolt. I throttled back and banked. When I came out of the turn I saw the enemy gliding sharply downwards. I glided after it. The Nazi pilot made several attempts to level off. By gunning his motor he managed to fly level for a few seconds before dropping off again. He finally lost control and dove into the ground. The ship burned. I landed at my home airdrome. My plane was undamaged except for a dent in my propellor which caused heavy vibrations."

One of the most spectacular instances of ramming which throws an interesting sidelight on the combat psychology of Russian airmen was told by eyewitnesses at the airdrome over which the battle occurred. Sergeant-Major Nikolai Totmin took to the air as his home field was attacked by eight Ju-88 dive bombers escorted by a pair of Me-109 fighters. Totmin set one bomber's port engine afire with his first burst but was attacked by the Me fighters before he could finish the bomber. Totmin banked sharply to battle the fighters. One Me followed the bombers but the other stayed to take on the Russian.

Totmin and his Nazi opponent went into a tight circle trying to turn inside each other. The Nazi went into a quick climb and Totmin followed him. The Nazi then turned to attack and Totmin banked sharply to bring his plane hurtling head-on at the Nazi. Both planes sped toward each other but at the last moment before collision the Nazi heeled his plane over. At that instant Totmin banked in the opposite direction and drove his plane into the Nazi's wing.

Totmin's plane staggered under the shock and both planes spun earthward. Totmin twice tried unsuccessfully to bail out but the air pressure forced him back into the cockpit. The third time he got out but he was only 120 feet from the ground and his chute didn't have time to open. He fell not far from the wreckage of the plane he had rammed.

Tank Attacks on Occupied Villages

[An article from the Red Army newspaper *Krasnaya Zvezda* 23 April 1942.]

At the present stage of the Soviet-German war the Red Army has had to use tanks many times to fulfill combat requirements of breaking through a fortified region or successfully developing an attack. The tank application is particularly true when attacking an enemy who has concentrated his defense in villages due to severe winter weather.

On numerous occasions is has been clearly demonstrated that it is best to attack with small tank groups, the first echelon to include heavy tanks. When possible, this echelon approaches the given locality from an angle and concerns itself only with the edges of villages. Moving at high speed the tanks shoot at firing points situated in and between the houses, silence enemy machine-gun nests and emplacements, and disorganize the enemy defensive system. On one occasion infantry sub-units moving along with and parallel to the tanks were quickly able to capture a village in which the enemy defensive system had been disrupted by tank fire. When necessary to make a frontal attack, as when a village is spread out in a hollow, deep gully or along a river defended by steep inclines, tanks must move directly into the village.

Tanks of the first echelon must strike hard and quickly. They move in "V" formation, apex leading. The leading tank travels at top speed along the edge of the village, firing its cannon and machine guns. The remainder of the tanks follow at some distance, observing the sources from which the enemy returns fire. With this echelon, it is necessary to have infantry shock troops armed with automatic rifles and hand machine guns. They get off at the edge of the village.

The second echelon develops the attack in cooperation with other infantry shock troops. The third echelon is charged with supporting the infantry, wiping out remaining enemy resistance, and finally taking advantageous defensive positions against possible counterattacks. Attacking infantry units break into the village along with the tanks, skirt the enemy flank, and cut off his line of retreat. The engagement can only be considered concluded when the tanks have reached the opposite side of the village and the infantry has entrenched itself. Battle conditions call for complete coordination between tank and infantry units together with an excellent system of communication.

For some time the Germans have employed smoke in street fighting. When fighting is already going on in a village, they attempt to cut off tanks through smoke screens with the aim of outflanking and destroying the tanks. In such cases the tanks quickly assume a defensive formation; motorized infantry shock troops and sub-units press forward to ward off possible counterattacks launched under cover of the smoke screen.

Development of the Antitank Gun

[An article from *The Times* (London) 8 April 1942.]

In the last 10 months' fighting in Libya, tank warfare has won or lost every battle, and the tanks in use have changed beyond recognition. They cannot get enough armor and armament. As one side has improved its tanks the other has tried to out-do it, each side favoring its own basic machine. The Germans' choice is the heavy, well-armored tank, mounting a heavy gun, and they rely on one shot from this gun to be sufficient. The British favor lighter armor and greater speed, and rely on a lighter, quick-firing gun which has to get several shots home to be effective. The Germans declare that fire from a moving tank is ineffective and inaccurate. The British disagree.

But tanks are losing their personality. Up till now the chief function of the tank has been to knock out other tanks. Now they are also becoming a ferry service for infantry and antitank guns, and infantry are used to clear out the enemy's antitank guns. Behind the infantry come the tanks with their own supporting antitank guns which are more of a menace than the tanks themselves because the latest antitank weapons are incredibly advanced and good.

The "Coming" Weapon

Libya has proved that this is the "coming" weapon. It is no longer defensive but has become an offensive weapon and is well on the way to neutralizing the tank completely. Surveys of the Libyan offensive indicate that both sides lost more tanks by ground antitank guns than were knocked out by other tanks. Both sides have developed new antitank weapons of revolutionary design, and the German type is particularly revolutionary. It is a 105-mm with a tapered barrel. The tapering permits the force to be concentrated, giving greater muzzle velocity and staying power. The projectile is so heavy that it does not need explosive qualities. It has tremendous power over a long range and great penetration.

The British have developed their own types. The effectiveness of these weapons cannot be discussed in detail, but development is towards lightly-armored, powerful weapons, operated by small crews. They can outgun five times their number in tanks and are cheaper and easier to produce. Included in the antitank gun development is the field artillery, which is about to come into its own again.

In mobile warfare light and medium artillery are seldom used for anything but defense against tanks. While the specific antitank gun is developing into an offensive weapon, the field artillery is becoming a defensive weapon, primarily antitank.

But for either artillery or antitank guns to be effective they must have adequate infantry protection. The infantry now fight in close cooperation with the tanks in the thick of the battle. They are returning to the old close order approaches and are relying on much hand-to-hand fighting. Because of this the equipping of infantry with light automatic arms has never been more important, and it is thought that the Japanese have the right idea with their .22 repeating pistols. This gun enables each man to be self-sufficient for long periods, because quantities can be carried by one man. Its effectiveness is equal to the submachine-gun which the Finns used, and it is not so heavy.

Method and Material

Similarly, aircraft are changing. After the British offensive both the Army and Air Force spoke hopefully of an "all purpose" airplane. This is an airplane fast enough to fight and heavy enough and with a long enough range for medium distance bombing. Such airplane could be the perfect "battle airplane" that Douhet envisaged as able to be produced in large quantities and sufficiently flexible to permit continuous superiority in the bombing or fighting strength of air forces. To Douhet's concept has been added the necessity of mounting cannon and the low-flying characteristics that allow aircraft to destroy tanks. The Germans have an all-service airplane in the Messerschmitt 110, and the British in the Bristol Beaufort. After the Russian lesson the Germans are concentrating on tank destroying aircraft. A few 109 F's have recently appeared over the desert, obviously adapted for special

use against tanks. This will probably be Germany's surprise weapon in the coming offensive.

The coming test for all these transitions in arms and tactics will be disastrous for the army that has not made sufficient revolutionary changes to meet the situation. If both sides have made equal changes, then the defenders, as always, should have the initial advantage. With antitank guns suddenly looming as the key weapon whole armies may be moved in the best interest of these guns. Tanks, infantry, artillery, and aircraft will move in support of them, around them, and over them. That is why method and material are so important in the coming offensive. The change in application and in methods of warfare is so strange and simple that it is as yet unbelievable. In six months it may well be a different story.

Armored Grenadiers

New Weapon—Old Tradition

[An article in the German *Militär-Wochenblatt* 25 September 1942. Translated in the Army War College, Washington, D.C.]

For the first time since the origin of the National Socialist Army the Führer has given a name originating in the best traditions of German military history to an arm of the service which has been tested in battle, the Armored Grenadiers.

This event not only gives deserved consideration and recognition to a new and proved weapon but also connects the Armored Grenadiers, the youngest constituent of the Armored Forces, with the proud traditions of the German military.

The name "Grenadier" will immediately call to everyone's mind the picture of the Grenadiers of Frederick the Great, perfectly aligned, flawlessly drawn up, and well formed, who advanced frontally against the enemy as though acting under divine command.

This picture is a complete contrast to the original work of the Grenadiers, who were supposed to advance far ahead of the attacking troops in order to throw hand grenades into the ranks of the enemy.

Concerning the Grenadiers, a historian writes, " . . . one uses them for the attack and for dangerous actions as grenade throwers and must also supply them with muskets and swords. For such work one chooses men in the best physical condition, strong, of great endurance, and stout, ordinarily taking eight to ten men from each company. . . . Instead of a hat they wear a large Grenadier cap, in the large ammunitions pockets they carry three grenades filled with iron, and ready to explode . . ."

This original use of grenadiers necessarily made the name "Grenadier" one which carried high honor. The historian writes further, " . . . There were entire regiments and battalions formed from Grenadier corps, similar to the guards of ancient rulers, which were of remarkable size and character. . . ."

Even mounted troops, who had nothing to do with hand grenades, acquired the honorable name of "Mounted Grenadiers." Baron von Reffinger's regiment of dragoons was especially referred to by Frederick William I because it "showed so much distinction," and was therefore raised to a regiment of "Mounted Grenadiers."

In this manner, the name "Grenadiers," rather than becoming the name of a branch of infantry or cavalry, became a generally accepted term to describe elite troops.

One might believe that the Armored Grenadiers had only their name in common with the Grenadiers of the old army, however, that is not the case. Closer examination reveals that this new branch of the service—unlikely though it may seem—is closely allied in its tactical and operative employment and in its methods to the proud traditions of German military history.

The original purpose of the Grenadier was to deploy far ahead of his company which was advancing to the attack in block formation in order to destroy the defensive lines of the enemy by means of grenades, thus preparing for the breakthrough of the troops which followed.

What was done in a limited way then is done in a large way today.

The Grenadiers who formerly advanced to the attack ahead of the general front line can be compared to the Armored Grenadier unit in the Armored Division, which advances deep into the enemy's position, far ahead of all other troops, and by spreading death and destruction destroys the enemy's defensive lines in order to assist the units which follow in their task of delivering decisive blows.

No less significant for the Armored Grenadiers as a branch of the "Motorized Troops" is the fact, particularly important, that these mounted regiments have become associated with the idea of speed, and have been modern personifications of the "Mounted Grenadiers."

Both pictures—the original Grenadier as symbol of the attacking force advancing in front of his company to throw his grenades into the enemy, and the Grenadier as a symbol of the element of speed, personified by the Mounted Grenadiers—bind the new weapon with the old name in a living tradition.

The Armored Grenadier battalions, regiments and brigades represent a production of the armored forces in their organization, personnel and equipment. Taken from cavalry, mounted rifle, infantry and rifle regiments, its actual birthday is on 1 October 1935, the day the first German armored division was set up.

Since that day the Armored Grenadiers, because of their similiarity of weapons, have, in effect, belonged to the Armored Force.

Since the beginning of the war, tanks and Armored Grenadiers have cooperated with much success, constituted the attacking point of the victorious German Army, and stood in the thick of decisive battles. The great success of German armored divisions in this war is overwhelming evidence of the exemplary cooperation of the main elements of the "Mechanized Troops," the tanks and the Armored Grenadiers.

The tank regiments are the main force of the armored divisions, while the Armored Grenadier regiments constitute the storm troops.

The varied missions which are given to the Armored Grenadier regiments require a similarly varied personnel, organization and equipment suitable for the objective. Therefore, in a Grenadier battalion, besides the Grenadier companies equipped with various heavy and light weapons, one also finds a headquarters company, a rifle company, a heavy weapons company with light and heavy weapons platoons, tank destroyer platoons of various calibers, a motorcycle platoon, a communications platoon, units for reconnaissance and guide work, and pioneer platoons for particular missions. Repair troops or units take care of the maintenance of vehicles, and supply units see to it that troops have sufficient munitions, equipment and food.

The employment of the units of Armored Grenadiers in the sphere of an armored division is indicated by their extensive armament with medium and heavy weapons. Considering that the Armored Grenadiers are equipped with small arms of all types, very many light and heavy machine guns, trench mortars, light and medium artillery and antitank weapons of various calibers, they possess an unbelievable fire power.

However, the disposition of this new weapon becomes perfectly clear only with the equipment of a completely armored, land operated, specially equipped truck in which the elements of armor and speed are emphasized. Partly protected against infantry fire and splinters, the Armored Grenadiers can generally fight with most of their light, medium and heavy weapons from their "Armored-Grenadier-car." In case the course of battle or the position of the enemy does not permit use of the armored car, the Grenadiers would proceed to battle on foot.

The battle of vehicles and the battle on foot, and the combination of both methods of warfare are the identifying marks of fighting by the Armored Grenadiers. Their main object is to bring their great force, which can be controlled like that of tanks, into play in coordination with tanks. Often the Armored Grenadier units are obliged to precede the attack of the tanks and advance as storm troops. Such missions are: for example, stream crossings, attack of particular sectors of terrain, attack against an enemy in and behind fortified positions, attacks on bunkers, battles in inhabited places, woods, battles at night or in fogs. Missions which are particularly suited to the individuality of this weapon are surprise attack, utilization of favorable positions, and follow-up work in successful tank attacks.

At the same time it can be said that the tactical employment of the Armored Grenadier units is part of the entire mission of the armored division.

Various examples should throw light on the many-sided possibilities for the employment of this arm. In many instances it was as follows:

Somewhere the point of an armored division has fought its way to the vicinity of a strongly fortified sector of a stream. It is threatened by antitank guns, artillery, enemy tanks, strong bunkers and field fortifiications. On the same bank the enemy also maintains a strong bridgehead. It is necessary to take the bridge over the river, so that the motorized units may advance. A frontal advance by tanks would cause the enemy to blow the bridge sky high. Infantry for a surprise attack is still far in the rear. What is to be done? Attacking troops of the Armored Gren-

adiers detruck. It is possible to make a surprise advance at night and take possession of the bridge. Quietly and alone the Armored Grenadiers creep to the bridge; through close combat, man against man, without the use of firearms, the garrison is dispatched, the bridge is manned and secured, and the explosive charges are removed. Radio communication with the rear announces "bridge taken." Together with Armored Grenadiers the tanks move forward to the attack, break through the enemy positions in front of the bridge, relieve the advance troops, break through the enemy positions on the opposite bank, leave the mopping-up of flanking positions to troops which follow, and then the tanks and Armored Grenadiers pursue the enemy toward new goals.

Or:

Somewhere 90 miles east of the broken enemy front the most advanced group of an armored division has reached the highway to Moscow. It is necessary to block the road and bar the retreat of the encircled Soviets. The highway is bordered by difficult terrain—hills, ravines, valleys and many small woods. The nights are cloudy and pitch dark, the days dark and dreary; fog and the traces of snow can be seen. During the day the tanks command the field of fire naturally narrowed by the difficult landscape, but during the night it is possible for entire regiments of the enemy to slip through unnoticed between the various tanks, free themselves from the fatal trap, and break our weak lines from the rear. What is to be done? Call the Armored Grenadiers! Working off their trucks, they erect hasty emplacements, well adapted to the terrain, thus tightening the ring of tanks and stopping the flight of the enemy until the next morning when our Stukas attack the dammed-up masses and Armored Grenadiers and tanks advance to deal death and destruction.

Or:

Bridgeheads must be established, mine fields removed, woods and inhabited places mopped up, bunkers and field fortifications must be wiped out, cities stormed—all such operations in which the ideal cooperation of tanks and Armored Grenadiers cannot be fully achieved, that is where the Armored Grenadiers storm their way through to prepare for a new and powerful attack by the tanks. In every such case the Armored Grenadiers are the actual executors of missions given to entire armored divisions. In the accomplishment of their aims they can experience the wonderful sensation of individual combat—and then entruck once more on their Armored Grenadier-cars and attack in the vicinity, thus resting their weary bodies while fighting from the armored car, mopping up enemy positions along the road, advancing through villages in the first attempt, firing with all weapons, overpowering enemy batteries from the rear, breaking into the supply lines or lines of fleeing enemy troops, smashing vehicles and columns. . . .

High speed, armor and strong firepower produce the tactical versatility of an Armored Grenadier division, which, if the occasion arises, can undertake autonomous missions aided by antitank guns, antitank troops, antitank engineers, and artillery. *An Armored Grenadier regiment is a motorized division in miniature, an ideal attack group, and its commander can give it the most daring assignments.*

Particularly variable are the tactical possibilities of the battalion, the company, and even of the platoon. It is really a climax in military experience to go out with an Armored-Grenadier-truck on some mission, a climax which cannot be surpassed in its impression on the minds of both officers, noncommissioned officers and the men.

In every case the strong armament, the equipment with a special armored car, weapons and tools supplied to all Armored Grenadiers, officers and men, and the decisive importance of so many of the missions must make a strong impression on every Armored Grenadier. Fresh, daring—in fact, foolhardy—blood must flow in their veins; only real men who are filled with unqualified determination to fulfill their honorable tasks can be used.

To all Armored Grenadiers the name given by the Führer means both recognition and obligation.

It is a matter of pride to them to advance in the thick of the great breakthroughs and participate in the advances, the pursuit and encirclement battles, fighting strongly in cooperation with their sister weapon, the armored division, to bring victory to the German flag.

Attacking An Enemy Within Field Fortifications

[An article from *Militär-Wochenblatt* 3 July 1942. Translated from German in the War Department, Washington, D.C.]

The enemy since September 25 has been holding Village B, elevation 80, and the railway embankment, with perhaps one reinforced company in field emplacements.

The *reinforced 1st Battalion* (without the 2nd Company), not supported on right or left, has prepared itself during the night before September 27 in the vicinity of Village A, for attack at 0530.

The *Mission* is to take and hold elevation 80 and Village B.

Heavy arms: one light field howitzer battery has been assigned to cooperate.

Light infantry howitzer and antitank-gun platoon are attached.

The mission is well suited for battalion combat fire. Simultaneous following of Infantry Training Manual No. 9 is recommended. Attack phases, cooperation of the arms as well as accompaniment of our fire are especially important. From a distance of 400 yards the fire combat of each individual gun must be executed under control of a referee.

The *sketch of the battle* therefore serves for evaluating the possibilities. The sketch must be followed attentively, since in the text what has already happened is often not mentioned.

The most important detail is *organization of the attack* in Village A. The battalion does not wish to become involved in costly fighting in Village B but aims at delivering the attack at the right (3rd Company) of the point of concentration. Here is the battalion leader himself, and here is the bulk of the machine-gun company. Artillery and light infantry howitzer platoon receive missions for diverting the enemy in Village B if the attack by the 3rd Company seems about to be flanked from this point.

At 0600 the 3rd Company, deployed, leaves the vegetable garden east of Village A. Immediately behind follow two heavy machine-gun platoons and the 1st echelon of the battalion staff. Shortly after the 3rd Company has reached the creek, artillery fire starts against the vegetable garden and Village A. The heavy machine-gun platoon, which is in emplacement here to watch, has previously dug in and therefore suffers no casualties. The 3rd Company must not slacken.

Rapid deployment and forward! Battalion staff and machine-gun company remain close beside! Take cover from artillery fire!

Now the moment for the *1st Company* has arrived. By platoons, it leaves the shrubbery west of Village A in dashes and reaches the creek, platoon and group leaders at its head, as quickly as possible.

While the 3rd Company with enlarged distances and intervals climbs the slope to the railway embankment, the 1st Company organizes itself in its cover. A *transitory* assembly under good cover causes no damage.

At this moment there is complete opposition in the distribution of the 3rd and the 1st Companies.

The attack terrain of the 3rd Company as far as the railway embankment is a stubble field 800 yards wide, entirely lacking in cover. A machine gun from Village B flanks the left platoon with a few lines of fire. Artillery and light infantry howitzer open heavy fire (firing mission) and divert the enemy on the southeast edge of Village B. The attack spearheads (frontmost machine guns) engage the enemy's fire on the railway embankment.

Now further advances must be made dependent on the direct hits (fire referee).

The *light machine guns* continue firing reciprocally. From a distance of 400 yards, the *rifles* come into action and contribute to the fire. Both platoons on the right succeed in penetrating across the railway embankment. The *heavy machine-gun platoon* makes immediate use of this and goes into position (see sketch). The left gun-platoon is within range of two machine guns and digs in. The *heavy mortar group* has unfortunately not succeeded on the left. It was deflected in advance by artillery fire. It cannot remain on the stubble field and must dig in. At this moment the *battalion leader* is also incapable of motion. In the continuation of the battle, however, he has the advantage of being able to come into action directly with the company at the point of concentration.

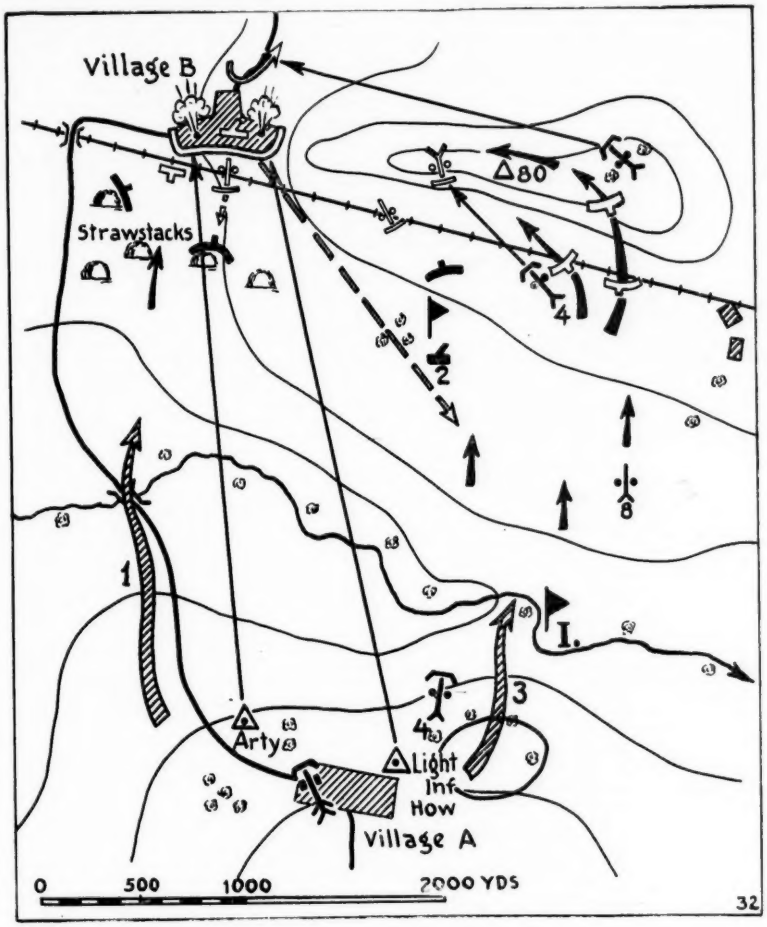
The 1st Company, beyond the creek, also has coverless terrain. It works forward in individual thrusts to the straw-stacks. In doing so, a transition is made from distribution in depth to distribution for fire combat. The enemy is still stubbornly defending himself in Village B. The arillery does not reach him on the railway embankment. *The 1st Company must therefore conduct its fire with its own forces.* Every man must fire! After fire superiority has been won (observation of hits), the company leader by personal example, rifle in hand, *gives the call to attack,* bringing the victorious platoon out of firing combat into *assault.*

Portions of the enemy are leaving Village B northward under the effect of

the artillery fire and the assault of the 1st Company. Here they are attacked by the flanking fire of the machine-gun company and flee farther back. The 1st company takes 60 prisoners. The enemy can no longer hold elevation 80.

5. In terrain poor in cover, quick digging-in acquires importance.

6. From 400 yards distance, heaviest fire combat with *all* arms of the rifle company. Contest for fire superiority.



The *attack objective* has been reached. Summarized, the following *lessons* are derived:

1. No schematic employment of the rifle companies. Form concentration points.

2. Visualization in advance of combat missions for artillery and infantry guns. In this case, better *fire support* than *fire preparation.*

3. Heavy machine-gun platoons distributed forward in open terrain. Otherwise, under enemy fire, they can no longer go into position.

4. The rifle companies move forward widely distributed. For fire combat they close up.

7. Discontinuance of fire with call to assault.

8. The infantry combat up to the time of the hand-to-hand fighting is fire combat.

The enemy remaining in the excavations was annihilated in hand-to-hand combat. Fleeing portions shattered, 60 prisoners, 2 mortars and 4 machine guns captured. Losses in our battalion were 6 dead, 22 wounded. A large part of the attack (from the distance of 400 yards) was conducted across coverless terrain. About 12,000 rounds of shells were fired.

Organization, decision and fire brought success.

Dust

From a study made in India

It is obvious that the British realize that dust is a very great problem under certain circumstances. For instance, they now issue at least two types of goggles that fit close to the face for use of truck drivers working in motor convoys in India and also issue respirators to tank crews in Near and Middle East theaters of war.

That many eye irritations result from dust is known. These are usually classified in bulk in India as "Opthalmia." That the nasal mucous membrane must become hardened is apparent to anyone who has experienced long, or even short, exposure to the effects of dust in the extremely dry air of Central and Western India between the months of November to late June inclusive. During this period the fine particles of dust which are inhaled through the nasal orifice adhere to the mucous membrane, drying up all the secretions and forming hard crusts which often are difficult to remove except by douching. Similarly, these fine particles of dust are inhaled into the air passages of the throat and lungs causing irritation and resulting in the production of a large amount of mucous and consequent coughing to expel this mucous. Often when coughing up this mucoid material it will have the appearance of mud, there being so many dust particles present.

Under normal circumstances the effects of dust are injurious to the people of India, but it is obvious that dust thrown up by motor traffic such as is present in military motor convoys will present a very much more difficult problem. It is possible that military personnel subjected to dust might be invalided from that cause, provided they do not have the benefits of some form of protection such as goggles and respirators. It is also possible that this factor might become responsible for a pension hazard through irritation to sinuses or undiscovered lung defects.

Effect on Motors

Up to a point, dust has a beneficial effect on camouflaged externally painted surfaces, helping to blend those surfaces to the local color and texture. On tires and rubber parts the erosive action of sand and dust considerably shortens the effective life of the articles by from one-half to four-fifths. Exact data in this respect is not available here, but undoubtedly has been reported from the Western Desert.

The most injurious action of dust is found in its adherance to oiled bearing surfaces such as springs and shackles, axles, bushings, etc. The guard against this must be constant and the counteraction thorough; less in the case of wear on relatively unimportant surfaces as springleaves; more on those parts which by their constant close fit insure long life, safety or precision as axle bushings and front wheel bearings. Where possible the wearing part is covered with cloth or leather, easily removable for cleaning (gun axles) or entirely dustproof enclosed (traversing gears). In any case whether totally, partially or not protected from dust, it is always necessary to inspect, clean off, and re-oil regularly, frequently and without fail as a maintenance *must.*

Internally.—Since a motor breathes air, dust is present in varying quantities depending on the equipment furnished and the precautions and care observed. The problem of letting in dustless air has been solved almost completely by the motor manufacturers, but the driver of the vehicle and the motor men of the unit must continually implement this excellent beginning. All concerned must be taught the far reaching importance of dust wear; they must be made *dust conscious* and thoroughly educated not to underestimate the harmful effect of grit accumulations in their motors.

The average "air-intake" per minute of the modern automobile engine amounts to approximately 100 cubic feet through the intake manifold and from 3 to as high as 27 cubic feet through the engine ventilating or "breather" pipe. The concentration of suspended dust and grit particles in the aspired air varies to a great extent. From data recorded in the United States, a concentration of approximately 1 ton of dust per cubic mile of air may

be regarded as normal in industrial cities and may, in certain localities, reach as high as 6 tons per cubic mile.

There is no recorded data on dust concentration in the atmosphere in India but it is certain that in some areas the above figures will be considerably exceeded.

Even the most modern air cleaners fitted to automotive vehicles do not entirely eliminate all the dust suspended in the intake air, and any air filtering devices of present day design capable of delivering absolutely dust free air to the engine would be so bulky as to occupy several times the size available under the average automobile hood.

Road dust by its siliceous nature has an abrasive action which causes serious and rapid wear of the pistons, rings, cylinder walls and valve mechanism, resulting in excessive oil and gasoline consumption. When excessive oil consumption takes place, which is one of the first signs of wear brought about by dust, many civilian owners and drivers have adopted the short sighted policy of using cheap, inferior engine oil which has in turn ruined a considerable number of engines involving large sums of money for labor and material to cover the cost of repairs.

Tests made on truck engines fitted with and without felt type air-filters, under identical conditions of service indicated nine times the amount of wear on the cylinder walls in the case of the engine that was not fitted with an air-filter, four times the wear on the pistons, and ten times the wear on the piston rings.

Various designs of carburetor air cleaners have appeared on the market over a number of years to overcome this problem: They include removal of dust by centrifugal action, the use of heavy filtering material such as felt, and the removal of dust by passing the air over oil.

Preferred attention to be given to frequent cleaning and flushing of air cleaners. Intervals at which air cleaners should be serviced depend on operating conditions. In the case of passenger cars touring over dusty roads in this country, 3,000 miles should not be exceeded without thorough rinsing of the air-filter element in kerosene, re-oiling with motor oil and in the case of oil-bath type filters —cleaning the oil reservoir and refilling to the correct level with motor oil (SAE-50 grade). The air-filter element on the crankcase ventilator or "breather" pipe should likewise be serviced.

In the case of motor vehicles traveling in columns and subject to heavy continuous dust conditions, it may be advisable to reduce the cleaning intervals to 1,000 miles or even less. In the case of tractors, daily cleaning of air filters is advised by the manufacturers. If engaged in exceptionally dusty work, such as road building with "bulldozers" in the dry season, cleaning at from 6-8 hours intervals is advisable.

If vehicles have passed through sand or dust storms, immediate cleaning of the air filters is advisable.

It should be borne in mind in this connection that clogging of the air cleaner elements with dust obstructs the air passage to the carburetor and thereby greatly reduces the operating efficiency of the engine.

Positive elimination of dust, sand and grit particles accumulated in the crankcase system by more frequent oil-changes accompanied by thorough flushing of the engine with a lightbodied "flushing" oil.

Even the most efficient oil filters, as attached to modern automotive engines are not of the continuous flow-type but operate on the continuous by-pass principle, filtering or "re-conditioning" part of the oilstream only and do not therefore speedily eliminate excessive amounts of dust and grit particles which may enter the crankcase through the breather pipe. The continuous flow strainers on the other hand, which are usually provided in the oil pump, do not arrest and retain fine dust particles.

In the case of vehicles operating under abnormally dusty conditions it appears therefore imperative to resort to draining and changing of the engine oil at more frequent intervals than under normal operating conditions. Cleaning and/or changing of oil filter cartridges should likewise be attended to more frequently. There is no reliable yard stick to define the exact mileage or operating hour intervals at which oil changes should be effected to prevent excessive engine wear but an oil change at the earliest opportunity should be made if a vehicle has passed through a prolonged dust or sandstorm, such as frequently encountered in the Northern parts of India.

Even under normal operating conditions it is better to err on the side of rather frequent oil changing as a safeguard against engine wear. A policy of frequent oil changing is besides not incompatible with oil economy as, especially where a large number of vehicles are operated in units forming a fleet, the drained used crankcase oil can be easily collected and efficiently restored for further use in I.C. Engines with a minimum loss—with the help of modern filtering and reconditioning plants.

The reconditioning of the latest "additive" or "inhibited" type I.C. Engine oils for further use in such engines presents a slight difficulty inasmuch as the carbon and gum-solvent special compounds in these oils become exhausted in the course of service and cannot be restored by filtration or any other method of reconditioning. Such used "inhibited" type of oils, if reconditioned, can however be very satisfactorily put to use again as regular type, non-inhibited Motor Oils.

In the case of gasoline engines, the *admixture of an upper cylinder lubricant* to the gasoline in order to prevent dry-running of the top portion of the liner which is subject to the heaviest rate of wear is advocated. This measure also improves valve stem lubrication.

In addition to fitting the vehicle with the proper air filter the following maintenance must be performed:

1 Frequent change of oil in air cleaner.
2 Frequent change of oil in motor.
3 Frequent lubrication of the chassis.
4 Maintaining motor in clean condition.
5 Periodical inspection of front wheel bearings.
6 Periodical inspection of brakes.
7 Change of transmission oil, and differential.

Chassis lubrication and wear of chassis components, such as the steering gear spring bolts and shackles, etc., are also affected to a great extent by excess dust conditions as encountered on the majority of roads in this country. The use of a substantial-bodied, stringy and fibrous consistency grease with a high melting point, which will "stay put" even under the high summer temperatures encountered in India, is strongly advised.

A soda soap-base grease with high oil content which is capable of forming a semi-fluid, tough and shock resistant lubricant film on the moving surfaces and yet—by remaining "plastic" at the outer edges of the bearings—seals them effectively against the entry of dust—and water—is the ideal chassis lubricant for all heavy duty service conditions. Correct chassis greasing intervals also depend to a great extent on service conditions, but should never exceed 1,000 miles.

Some manufacturers fit their motors with special dust preventing parts, for example: A special valve cover assembly has been released by Chevrolet under part No.605939 which does away with the louvres normally found in the valve cover of a Chevrolet engine and has in its place a filtered breather, the purpose of which is to catch the dust before it enters into the valve rocker chamber.

Another modification released by Chevrolet as a safeguard against dust entering through the crankcase breather pipe attached to the oil filter, is a special valve assembly, the use of which permits of the breather pipe being entirely blocked and yet catering for the required amount of crankcase ventilation. This assembly has been released by General Motors, Canada, but can be adapted to the U.S. Chevrolet engine.

So far as actual lubrication in India is concerned, the following recommendations have been received from General Motors India Limited, Bombay, to be used as a guide only:

	Paved Roads Miles	*Dusty Roads Miles*	*Sandy Tracks Miles*
Change motor oil every	1,000-1,200	500-700	300-400
Change air cleaner oil every	1,000	500	200-300
Chassis Lubrication every	1,000	500	200-300
Front Wheel bearings every	10,000	5,000	2,000
Change transmission oil every	10,000	5,000	2,000-3,000

Effects of Dust on Other Equipment

In general it may be stated that individual organizational equipment simply wears out faster in dusty country. Arms and weapons of all sorts from the automatic to the artillery piece must be continually maintained. Cloth and leather are worn out by abrasion in from one-tenth to one-fourth the normal time, and the mental wear and tear on the owner is equally subversive.

Certain expedients are helpful in overcoming the secondary effects of dust and sand, for instance sand mats and sand tracks are issued for the use of vehicles operating over sandy soil.

Effects on Operations

Operations by mechanized units *in heavy dust and sandstorms* may be compared with those at night. Directions and identifications are made difficult, withdrawals made easy. Firing of pieces by direct laying is restricted because of the muzzle blast. The location of Artillery OP's requires extra consideration. Strategic moves may be made without disclosure, but close-in attacks by tanks are not considered profitable. Infiltration by various types of units is favored, but surprise is apt to be double edged.

In heavy dust areas each vehicle moves in its own small dust storm. Surprise is impossible and offensive maneuver difficult. The artillery is hampered especially in direct firing and all vehicles

must move at increased distances and down wind from occupied points.

In any case operations are considerably slowed not only because of low and intermittant visibility but most often by excessive times-out for maintenance, recovery, and repair of vehicles; and the supply of equipment, extra parts, in fact, in all categories, deserves great thought and care in planning.

Conclusions

Dust does affect military operations in this country by its actions on men and matériel, and therefore it must be combatted, not toward its elimination, but to minimize its effects.

Staff planning should consider:

1 Proper eye and throat protection for drivers and crews of vehicles.

2 Training in care and maintenance of motors and other matériel both externally and internally.

3 The issuing of suitable equipment.

4 The coordination of season, supply, and replacement with the operations planned.

The First Battle with Russian Heavy T-34 Tanks

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article in *Die Panzertruppe* June 1942.]

Between the "Kessels" Vyazma and Bryansk, the motorized division worked its way ahead toward the northeast over roads which run through ancient woods. We of the advance detachment were a day's march ahead. In the main body of the troops of the advance detachment there were antitank and bicycle troops.

During the day we attacked and captured three villages. More than 100 prisoners were taken. The town of J_____, which occupied a commanding position and which was the key position of the line of Russian fortifications, was really one day's objective. We wished to retain what we had already gained, but we left only a few forces behind to protect this key position. For practical reasons, those troops whose fuel had become exhausted were thus left. For all tank cars were stuck in the muddy roads, as were all trucks. By dividing up our fuel we succeeded in keeping at least most of the tanks in shape for a few more miles' journey.

The main body of the battalion pushed on toward the north in order to prevent the routed enemy from obtaining any rest. With the pride and caution of victorious warriors, the point of the detachment made up of antitank and bicycle troops dashed ahead. And what soldier was not filled with joy by such pursuit in agreement with the old saying, "fast, bold and hard as iron!"? The advance guard had already passed the church which stands alone in the center of a clearing in the woods one mile south of M_____ when bullets coming from the right began whistling about our ears again. And as we pulled our necks in a little, the cry came back from the front which always provides one of the proudest moments for us antitank men: "Antitank men forward! Enemy tanks!"

In a moment all was in a state of wild activity! In the woods there were enemy rifle troops, and, in addition, enemy tanks up ahead. Away we went after them, in advance guard style! Automatically the last of the antitank guns of the 1st Company roared to the front. Our only medium antitank gun which was with us also rolled up ahead. A spirited fight quickly developed.

These were fresh enemy troops. We must take the wind out of their sails doubly fast. When close to the church the commander curtly gave the order to attack: "Fresh troops with tanks are facing us on the highway. We attack the enemy on both sides of the highway, repel him and take possession of M_____.

"Former advance guard, the Vohburg Bicycle Company with subordinated 1st Antitank Company, to the left of the highway; to the right of the highway, 3d Antitank Company with subordinated bicycle troop; 2d Company at my disposal in woods 500 yards south of the church. Commander of Reconnaissance Battalion with rest of Battalion assumes mission of reconnaissance and security on flanks and in rear. Battalion command post—the church."

While the newly engaged units were pushing forward against enemy rifle troops in the woods to the east of the highway, a drama developed around the first of the tanks.

A half dozen antitank guns were laying down a true drum of fire on it. But it moved unconcernedly through the midst of our line like an invulnerable prehistoric monster. It is one of those thick armored tanks which can hardly be penetrated by light antitank cannon. Evidently, it has a small field of view. It ran over a bicycle here and there, but it did not succeed in finding our antitank gun positions and its fire went into empty air. To be sure, the men at the antitank cannon knew how small a chance they had of success, but in spite of that, not one of the antitank guns stopped firing. It is a matter of honor here whether tank or antitank cannon will win; and it must be shown, therefore, who will hold out the longer. Shot after shot bounced off the tank. Fifty hits had already been counted. "Antitank men: stay with it!" rang in the ears of every gunner and his helpers. Closer and closer came the invulnerable colossus. It was now hardly more than 30 feet from two of the antitank guns of the First Company. And now it picked its way between these two guns as if it wanted to force vividly home to us the hopelessness of our task by means of the ricocheting projectiles. But our antitank men stood doggedly on the job and continued to fire at closest range at the tank which was now passing between them. And as it passed on its way unhurt they suddenly turned their cannon and fired at the rear end of the armored monster which was planning to create havoc in the midst of our company. This spelled doom for the Russian tank for in the position which it occupied momentarily, our projectiles were able to strike it with the desired vertical impact. This was immediately recognized by the gunners. Now the shots quit bouncing off. One of them imbedded itself in the tank. A fraction of a second later the second and third projectiles penetrated this "Achilles heel." Severely wounded, the tank stopped but like a mortally wounded prehistoric dragon, it roared desperately and with primative rage, spewed fire from all its guns. Three more shells which penetrated it did not put an end to its raging gun fire. Other means had to be used. Who would undertake the job? Who was the man? For a long time the daring company commander had waited for this moment. He was not willing to lose such a tasty morsel as this. In a few short dashes he was there. He climbed atop the tank from the rear and threw a couple of original Russian "Molotov cocktails" at it. And at the very moment that the glass bottles broke on the armor, the whole tank was engulfed in bright flames. One of the antitank men threw a bottle of gasoline into the fire. It now got too warm for the Russians. The turret lid opened, some sort of object like a short, thick barrel appeared, and with his machine pistol spitting fire, a man clambored down out of the turret. The man was laid low with a pistol shot. The ammunition in the tank began to explode in the billowing flames and soon developed such power that the entire turret was blown off.

To the right of here the antitank company and the bicycle troop, fighting stubbornly with bayonets and hand grenades against the Russian rifle troops who were well concealed in the brush, had advanced to the same point. With united strength, the attack was carried forward through the woods on both sides of the highway, and through the town of M_____.

Several tanks of the same 34-ton brand as the wrecked tank (more cautious, however) fired from all possible places of concealment at our assault troops. The antitank men of the 1st and 3d Companies pulled and pushed their guns through brush and woods and from house to house as the tanks went on ahead of them. One platoon of the 2nd Company was just being brought forward when six tanks were discovered. While the bicycle troop was advancing stubbornly against the Russian infantry, raging duels again developed between antitank troops and tanks. In spite of the fact that as before all the shells bounced off the armor of the tanks with a loud crash and bright flash, they succeeded not only in preventing the tanks from engaging in the infantry action but by giving one another fire protection, the antitank troops were able to get up to within a dangerous range for the tanks.

Many a bicycle trooper, among them our youngest lieutenant, fell severely wounded in front of a Russian machine-gun nest and many an antitank man dropped beside his gun. Our loudly roaring medium antitank gun which had won the special hatred of the tanks, received terrific fire from the 75-mm tank cannon. One of the cannon wheels was torn to pieces with a thunderous crash by one shot. The gunner was struck in the leg by a flying fragment, but with clenched teeth, he remained at his gun.

The first group of prisoners were brought back to the battalion CP. The examining administrative officer learned that they were troops who had just been brought in from the vicinity of Moscow. Strongly supported by tanks, they were supposed to prevent the Germans from penetrating the line of fortifications. Unfortunately, they had arrived a few hours too late for this. We noticed their fur caps, the practical winter headgear of the Russian soldier. We saw them here for the first time.

The antitank men of the 1st and 3d Companies succeeded in getting so close to a tank and in pouring such a thunderous hail of shells onto it that it was too much even for the nerves of the Russians. The tank tried to withdraw across a small

bridge. It got out of control there (the men were probably somewhat dazed from the effects of the ceaseless rain of shells on the armor plate), ripped off the bridge rail and plunged turret downward into the stream. The second tank was put out of action.

This sight as well as the continuing rapid fire of the antitank gun probably hastened the decision of the other tanks to break off the fight and to withdraw toward the north.

But while the attack progressed in a lively manner on the front, the firing in the rear of the battalion kept getting more intense. The operator of a company radio station sought the commander who up ahead was leading the attack of the combat groups: "Radio message from battalion combat post: A Russian battalion is coming from the south. Reinforcements urgently requested." The antitank platoon of the 2nd company could be spared up front. It was quickly withdrawn from the right and sent to the rear. A motorcycle roared up. The Adjutant jumped off and hurried to the Commander. And what he reported was not exactly joyful news! A Russian battalion with heavy weapons was attacking from the south. What remained of the 1st Bicycle Troop and the 2nd Antitank Company could not hold out much longer. Everyone including the staff who was available had already been engaged by the commander of the reconnaissance battalion. The casualties were mounting. One of the antitank guns had received a direct hit. The situation had become threatening. This again called for cool-headedness and determination. We had to get away from our "two front" war and get back to a single, hard-hitting front. For this reason our northern enemies had to be put on the run with a hard attack. After the tank attack had been repulsed, we had to break the backbone of the stubborn resistance of the Russian infantry. The light trench mortars and their big, fat brothers, spat their winged eggs out of their barrels, the light machine guns fired violently in short rapid bursts of fire. The heavy machine guns cut loose in a clattering stream of steady fire and now the hard, clear report of the antitank cannon was heard firing with explosive shells. The "Vohburg" men leaped forward, and the men of the Müller troop went after the fur-capped Russians with "Furor teutonicus."

The heart of the man who has such soldiers under his command beats more strongly with pride and joy, and these moments will never be forgotten by any one who participated in these events. Whoever of the enemy did not seek safety in flight went down under German fire or was taken prisoner. More than half a hundred dead Russians already covered the battle field and sixty were brought in as prisoners. The village of M------ was taken and the woods cleared of the enemy. Then the main body of the battalion stopped and reorganized. In the meanwhile the enemy, who was in retreat, was watched over only by scouting troops. The northern front now faced about, and with front toward the south attacked the Russian battalion with its old energy. It was a battalion which had escaped the encirclement at Vyazma and was trying to fight its way back to Moscow as was learned from the statement of prisoners. Our attack was now carried out in all its details and intensity. The unexpected and hard counter-attack was too much of a surprise to the Russians. Our wrecked antitank guns were now doubly avenged. The battalion had already been repulsed by our security at J------. It was now thrown back again toward this security. A steady attack from the front and now fire in the rear in addition—the Russians could not stand this. In a very short time, as may be imagined, the battalion was completely disrupted. The threatening danger was removed.

We were able to report to the Division as the results of the day's work: "300 prisoners, two heavy tanks, two antitank guns destroyed, many weapons of all kinds as well as horses, motorcycles and a war chest captured." On our side 5 brave comrades sealed their fidelity to the Führer and the Fatherland with their death. Thirty men were wounded.

The division rewarded the brave cyclist troops and the valiant antitank men with a large number of decorations.

German Defense in Encirclement

[An article from the Russian newspaper *Krasnaya Zvezda* 4 April 1942. Translated at the Command and General Staff School, Fort Leavenworth, Kansas.]

Generally, when encircled, German forces keep to normal methods of defense tactics. However, the absence of strong reserves, shortage of ammunition, ever-present threat of attack from any point in the ring of encirclement and finally, depressed morale of German personnel have forced the German command to introduce considerable innovation in the organization of defense.

It is known that under normal conditions Germans exert their main efforts toward creation of defense centers in populated localities. Houses, especially those built of stone, are transformed into well fortified firing points. Basements serve as shelters. Barricades rise on the streets. All points of resistance and centers of defense are interlocked in a system of fire and constantly maintain cooperative action. During the initial period of action against encircled enemy forces our army has encountered this method of defense.

Under the conditions of having adjoining flanks, when the activity of the rear was normal, this method of defense was considered by the enemy to be the most favorable, but when faced with complete isolation it is not entirely satisfactory. Our forces have greater opportunities for outflanking and encircling individual centers of resistance; they locate weak spots in the defensive system with greater ease and deliver more telling blows. Great losses are inflicted by small groups of our infantry which penetrate deep behind the enemy rear.

In this respect the information given by the commander of the 415th German Regiment is illuminating. Here is what he writes about the lessons of one night attack of Soviet infantry:

> Time of attack—3:40
> Strength of attacking force—30 to 40 men.
> Clothing—camouflage robes.
> Equipment—rifles, automatic weapons, hand grenades, tied bundles of grenades, incendiary bottles.
> Circumstances—attack executed simultaneously on all sides. Hand grenades thrown into windows of houses. Barns set on fire. Russian advance towards village completely concealed. Russians came so near that interval between alarm signal and taking up of combat posts was not everywhere sufficient to provide resistance . . .

Drawing bitter lessons from these events (there were very many of them), the Germans applied a number of measures. They reinforced posts of outside and inside security. For defense against hand grenades they placed special shields (shutters). They held frequent alarm drills. However, all this was too little. Aviation attacks and artillery-fire raids were added to deep sorties of our infantry. The enemy was unable to counter them effectively. Despite circular defense it is difficult to create a solid system of artillery and mortar fire on all sides. This was speedily exploited by our artillerymen. Skillfully they located convenient approaches, rolled the guns out into open positions and demolished fortified enemy positions with point blank fire.

All this taken together (sorties into the rear, air raids and deadly artillery fire) have forced the German command to change tactics. This is what we read in a captured headquarters document:

> The front line of resistance is not to be defended according to the principle of points of resistance based upon populated localities, but rather, temporary positions are to be erected, making use of all means present. No firing positions are to be made in houses . . . Machine guns are to remain silent. Only if enemy infantry comes up too closely may machine guns begin action. Artillery is to change positions frequently . . .

At the present time the enemy is gradually passing to erection of positions on elevations which lend themselves for defense, and which afford good circular field of fire and observation. To places where positions are to be erected, explosive agents are brought up to speed the work of demolishing buildings. From logs of demolished peasant houses the enemy builds log and earth fortifications and blindages (overhead coverings). Positions are carefully camouflaged and surrounded by a great wall of snow, more than two yards high.

In organizing defense on open terrain, German units under conditions of encirclement pay even greater attention to circular field of fire. This is clearly illustrated by the fire plan of a center of resistance (Fig. 1) captured by our forces. Besides the basic fields of fire shown on the diagram, platoons have reserve trenches which permit conduct of fire in any direction. Neighboring centers of resistance on right and left (along the front line) are situated at short intervals, thus forming a solid defense line. All defensive constructions protect each other's flanks, while in front all kinds of obstacles are built and a zone up to 400 yards is completely cleared.

In order to eliminate the danger of sudden attack, especially at night, the Germans make hap-hazard arrangements for illuminating signals. In some cases these consist of iron cans with a very small cap inside; in other cases there are

special petards (for frightening effect) and fixed hand grenades with attached cord. As soon as the advancing Russian touches the cord, the grenade explodes. On some sectors of enemy defense special mines were encountered which upon exploding produced a cluster of light similar to a light rocket. When erecting obstacles in front of the front line of resistance, the Germans are unable to create solid mine fields. Mines are placed only where there are concealed approaches or where concentration for a counterattack is possible. A favorite German method is mining demolished houses and destroyed bridges.

It is necessary to give separate consideration to the questions of antitank defense. Having experienced the power of blows from our powerful tanks, the Germans long ago recognized that their artillery alone is unable to cope with Soviet armored forces. In addition to this, German artillery when encircled needs ammunition and is forced to fire only in the most extreme cases. This is why the Germans are beginning to search for other means of resistance against tanks.

In one of the captured documents the following is read:

> The appearance of Russian tanks still is fraught with the greatest danger for some companies. Antitank weapons and artillery are by themselves insufficient for antitank action. The company should take its own measures.

Special anti-armored storm detachments which consist of five men and one leader are formed within units. This group has five special grenades, compressed charges each weighing eleven pounds, four antitank mines, three smoke candles and three bottles each containing an incendiary agent.

Their tactical methods are designed mainly on suddenness of action. As soon as our tanks penetrate beyond the front line of resistance, the German group attempts to take possession of the dead area and tosses a grenade on the turret or the motor compartment of the tank. If unable to get close to the vehicle, then the Germans place a mine along its line of movement. This once more emphasizes the importance of mutual fire assistance among our tanks and uninterrupted cooperation of artillery and infantry with tanks. Of great aid in this regard are infantrymen armed with automatic weapons who ride atop the tank. They are able to find the enemy lying in ambush and dispose of him in time.

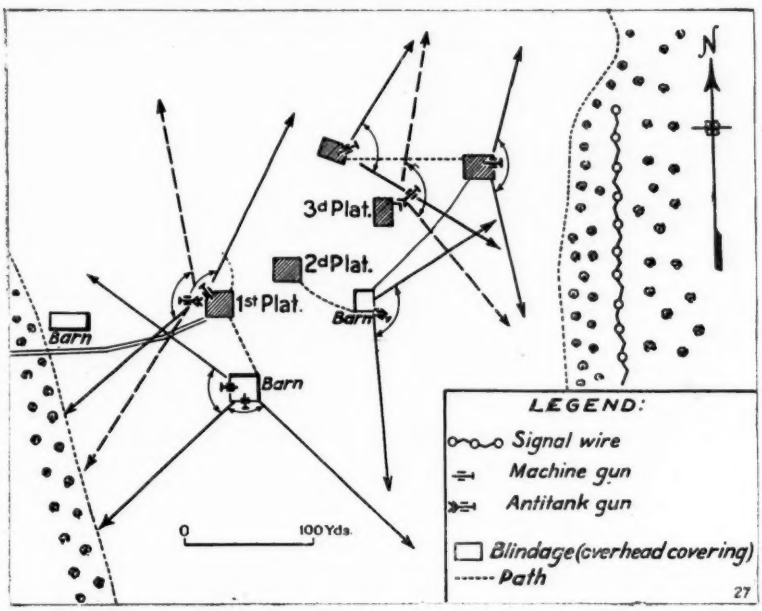


FIGURE 1.

Lack of a sufficient reserve is the greatest affliction of encircled German forces. Almost all their available forces, including quartermaster, construction and veterinary units, are pressed into combat. In place of an operative reserve the Germans try to use any unit at all for support in some centers of resistance. As we attack a position or center of resistance, the Germans attempt to counterattack with the forces of such a support. If the counterattack is more or less successful the German reserve is immediately brought back to the rear. If unsuccessful, units thus pressed into combat assume the defense and cover the retreat of the surviving infantry to the next positions. It is understood, of course, that when our attack is well organized, when its power is not depleted, and on the contrary, when it grows to greater strength for the moment of the decisive blow, then as a rule, not only the counterattacking German groups are destroyed but also those German forces hurrying to take up the next defensive position are disposed of.

In many cases the Germans try to compensate shortage of reserves by transferring small units from other sectors. The direction of such transfers may differ. The most characteristic variants are illustrated in Fig. 2. It is seen here that the Germans send forces from the neighboring sector or from the opposite sector of the circle to the sector where danger is greatest.

If reinforcements to the encircled forces arrive by air, they are at first sent to the passive sectors, replacing units which have been under fire; and these latter proceed into the sectors where combat is active. The German command has been compelled to do this because the "spring reserve" (*Ersatz* battalions) thus brought up consist of men with physical disabilities and who are poorly trained. To facilitate this maneuver the reserves clear old roads and make new ones leading from the center to the outlying sectors.

From all this it is not difficult to draw the conclusion that it is necessary to deliver simultaneous blows on the enemy from several directions. Only thus is the enemy deprived of the opportunity to maneuver his personnel and equipment at the expense of other defensive positions. The lack of operative reserves makes the situation of German forces still worse.

Along with this, another thing is important—the protection of the flank and rear of our advancing forces. During one of the operations the following situation arose. Our units, having broken stubborn enemy resistance, scattered the German group. They followed this by turning their front to right and left and began to widen the breach thus formed (Fig. 2). The enemy at first assumed mobile defense and somewhat later, having assembled forces within his principal group (not encircled), undertook a counterattack in order to break a gap in the direction of the encircled Germans to join them and thus cut off our forces which had broken through in the advance. Thanks to the deep echelon formation of our advancing forces, careful reconnaissance of flanks and thorough security provided for them, the enemy counterblow was repelled and heavy losses were inflicted on the Germans.

The tendency to join the encircled units compels the enemy to press into combat all his forces without regard for losses. The experience of battle emphasizes the fact that under such conditions decision and speed are the greatest guarantee of success. In solving two problems simultaneously—the destruction of encircled garrisons and the further widening of the breakthrough—it is necessary to determine the more important one, and the main efforts should be correspondingly concentrated. Evidently the foremost problem will be destruction of encircled enemy units, and thus having a free hand, all our forces must be thrown into an offensive against the main enemy force.

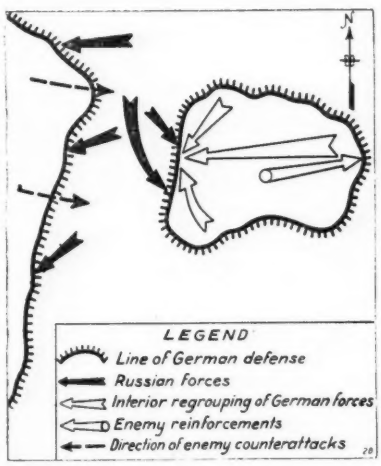


FIGURE 2.

A Practical Method for Transporting Pneumatic Rafts

[Translated from German at the Command and General Staff School, Fort Leavenworth, Kansas, from an article in *Die Panzertruppe.*]

Whenever a river is to be crossed, it is of highest importance that pneumatic rafts be floated in the water speedily. Usually they are inflated shortly before it is time to use them and then carried to the river by 6 to 8 men in double quick time. Aside from the physical exertion required by this method, it has the disadvantage of exposing the 6 to 8 men as a massed and vulnerable target.

FIGURE 1.

The method described here may be easily employed by any unit and has the following advantages:

1. The pneumatic raft may be moved long distances by one man and with almost no effort (see figure 1: The raft is fastened with its center of gravity over the board).

FIGURE 2.

2. The raft, inflated, and ready for use, may be towed by a motor vehicle, for instance, a side-car motorcycle, and transported any desired distance without taking any room on a truck (see figure 2: The rear third of the raft rests on the board).

3. Transported in an inflated condition, the time for unpacking and inflating at the destination is saved (of importance, for instance, in cases of surprise crossings and in scouting operations).

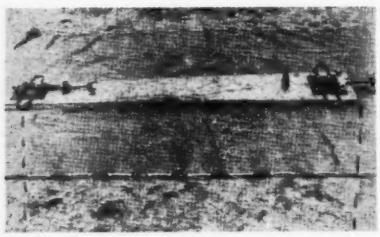


FIGURE 3.

4. Because rafts may be transported in this manner by means of motorcycles, motorized transportation is possible on the far side of the stream across which, on account of the lack of heavy ferrying equipment, it is impossible at the outset to move anything but motorcycles (especially important when several water courses have to be crossed in quick succession).

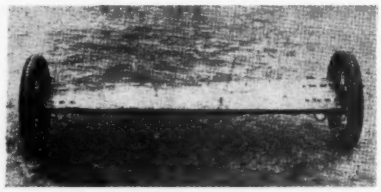


FIGURE 4.

The description of the construction of this pneumatic raft carrier is very short. One needs:

(a) 2 extra motorcycle wheels (which are to be found in any motorized unit).

(b) 1 truck seat-board or a beech board of the same dimensions (7 feet long, 12 inches broad, 1½ inches thick).

A motorcycle axle is fastened at each end of the board and by means of hinged attachment (as may be seen in figures 3 and 4) arranged so that it may be folded back and the board used as a truck seat. Loops are welded to the hinge arrangement to which the axles are attached and to which, in turn, the rafts may be tied with the ropes of the raft itself.

Thus, no special equipment has to be carried and the weight of the extra parts (the flat, hinged arrangement with attached axles) is slight.

This type of apparatus was successfully employed in the campaign in the western theater of operations by the Munich Antitank Battalion, whose head mechanic first put this idea into practice.

Artillery of a German Tank Division

[From the Russian newspaper *Krasnaya Zvezda.* Translated in the War Department, Washington, D.C.]

The following article is interesting in that it describes the composition of march columns and attack formations in addition to discussing tactical employment. Also, an important fact brought out is that regardless of the success of enemy tanks in a break-through, the infantry moving in support of the tanks must be stopped, as this prevents the artillery from moving up and deprives the tanks of their direct support. The tanks can then be dealt with much more easily. — THE EDITOR.

The organic artillery with a German tank division, as used against the Soviets on the Soviet-German front, normally consists of two 105-mm battalions and one 150-mm howitzer battalion, but is usually reinforced by one or two battalions of lights.

On the march, the CO's of the artillery regiments, battalions and batteries, plus a minimum of their respective staffs and control units, march at the head of the column. The artillery reconnaissance party marches with the tank reconnaissance unit. Battery reconnaissance parties consist of two armored cars and two motorcycles. In case one of the cars is destroyed the other can carry on the vital reconnaissance work.

Artillery observers ride in armored cars, types 253 and 254 being the most usual, which are armed with machine guns. In each car there is an observer, the observer's assistant, a radio operator and a driver. There are two such observation vehicles per battery. The battery commander rides in one, and another officer, who fires independent missions, in the other. Battalion has three such observers' cars.

Planes are assigned to work with the artillery of the division and are subject to call by the CO of the artillery who assigns through battalion one *plane per battery,* depending upon the amount of planes available. In the attack, normally, one light artillery battalion supports one tank regiment in direct support and the medium battalion is in general support. But in the majority of cases experienced, the artillery of the tank divisions has been reinforced so that two light battalions can be assigned to a regiment in the first echelon, which allows one light battalion per tank battalion. One battery of each battalion supports the right element of a tank battalion, another the left element, while the third is echeloned to the rear and is charged with flank security and rear.

Observation posts, command posts and battery positions are all moved as far forward as possible. Batteries fire from concealed positions, however, as a rule.

Preceding an attack, preparation fire is conducted from fifteen minutes to an hour on enemy artillery and tank assembly areas, and observation points are smoked. Enemy front-line infantry is generally disregarded during the preparation as their neutralization is left to the tanks. Direct support battalions do not always participate in the preparation fire but are put in march order with full supplies of ammunition, ready to jump off with the tanks.

The battalion commanders and battery commanders of direct support units remain at their observation posts in an attack until the head tank passes their line, at which time they take up their positions in the attack echelons. Battalions not assigned to direct support, however, push their observation ahead with the attacking echelons. The German general support artillery does not change its position in an attack which is designed to go no further than the enemy artillery positions. In an attack which is intended to penetrate beyond enemy artillery positions, however, they do move forward when practicable. If, however, the German infantry lags and is finally held up but the tanks break through and continue

forward, the general support artillery does not move forward. During the German break-through at the end of October 1941 from the city of Orel in the direction of Mtsensk, German tank units succeeded in breaking through the Soviet infantry lines, but the German infantry supporting the tanks was cut off and forced to dig in. The support artillery could not move forward and, as a result, the tanks, having no support from their artillery, were compelled, after suffering heavy losses, to return to their original positions.

Establishment of a Bridgehead

[From the German article in *Militär-Wochenblatt* No. 37, 1940. Translated in the War Department, Washington, D. C.]

This article was only recently received at the Command and General Staff School Library; however, old as the incident is, this article is one of the few which gives the tactics of the Germans in pursuit. For this reason it was thought well to include it.—THE EDITOR.

On the evening of 8 September 1939 Rzeszow was taken by the troops of a light division. The enemy fled farther to the east.

On the morning of 9 September the division decided to create two pursuit detachments. One detachment received the mission to advance on Radymno from Rzeszow via Tyczyn, Blazowa, Jawornik Polski, the crossroads south of Kanczuga, Pruchnik Miasto and Rokietnica to take the town of Radymno and to establish a bridgehead on the San. Execution of the mission was started in the way which had been tested and found best in the previous days. Individual objectives were set by the detachment commander, the reaching of each one being immediately reported to the division.

About noon a passage was made through Rzeszow, and after crossing the Wislok bridge which had been put in condition for the occasion, a turn was made southward toward Tyczyn. Taught by the hard experience of past days, principal attention was given to road mines. Some had already been recognized shortly before Rzeszow; a timely halt saved us from casualties. Quick calling up of a pioneer platoon promptly made a strip of mines lying diagonally across the road harmless by blasting. The delay, however, had robbed us of two more hours of valuable time.

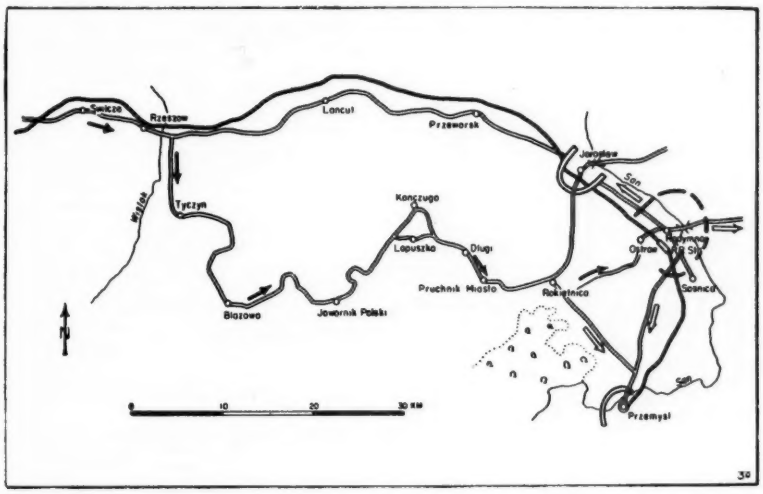
Unmindful of the possibility of meeting further mine fields, the advance now proceeded at a lively pace. At Pruchnik Miasto we had already overtaken the last portions of the retreating Poles and soon blasted and drove them into flight by heavy fire from automobiles. Now an unrelenting harrying by the enemy began.

At 4:20 PM Lopusska was reached, and the enemy was forced by our fire to abandon a 6-team gun with munition carts having the same number of teams, as well as baggage vehicles, and to flee into the woods lying on both sides of the road.

Out of Dlugi an enemy cavalry squadron succeeded in escaping with great difficulty and, in the fire of guns which we quickly unlimbered and fired point-blank, fled into the woods. Their fire, which was delivered from rifles, was returned; and in spite of already heavily threatened flanks, pursuit was continued along the road.

Captured Poles stated uniformly that in the woods south of our route of advance, Polish troops in effectives of at least a battalion were located, with artillery and supply trains, on their withdrawal to Radymno or Przemysl and that they had the intention of attacking us from a temporary prepared position.

How surprising to the Poles and how unrelaxed was our pursuit is shown in two incidents: just before Rokietnica there suddenly appeared out of the woods south of the road two civilian automobiles which advanced without suspicion up to the beginning of our column.



Polish officers sitting in the automobile discovered too late that the cloud of dust on the road was not caused by retreating Poles but by pursuing German troops. Greatly astonished and mortified, they had set out on road reconnaissance ahead of the Polish troops retreating at the side of us. A further example was that horses of captured cavalry men had scarcely any breath and dropped dead from exhaustion.

Rapidly growing darkness and the fact that we had already continued the pursuit for more than 70 kilometers (about 45 miles) induced the detachment commander to organize a night bivouac at the exit from Rokietnica. In constant expectation of an attack by Polish troops scattered through endless pieces of woodland on our flanks, the night was passed at the side of the road in an open field in the form of a rolled up hedgehog. Dead tired and covered with dust, without food—the field kitchens were not able to keep pace with the pursuit—we went to rest. For the detachment commander the decision was obviously fixed to take up pursuit again as early as possible the next morning toward Radymno, hardly 10 kilometers (about 6 miles) away.

At 5 AM on 10 September we started again and reached the western entrance to Radymno without serious resistance. When the first troops drove into the community, however, a lively machine-gun and rifle fire began coming from houses and fences in all the streets. Nevertheless, one squadron pushed forward to the principal square of Radymno. There a lieutenant with his platoon immediately turned to the road leading off toward Jaroslaw, which was full of fleeing Polish baggage trains firing to the rear. The rest of the squadron was immediately assembled by the squadron leader for further penetration through the city. By continuous fire from light machine guns it was possible to bring the Poles into desperate confusion. Soldiers hidden in great numbers in all the houses and vehicles standing in the streets soon began to flee toward the San in wild flight. The fact that at most only one squadron had penetrated the city did not occur to the enemy, a thousand strong. We had broken into the city so suddenly and unexpectedly like a wild raid that the Poles, as their astonished faces showed, could scarcely comprehend it.

On reaching the eastern exit from Radymno, a tremendous detonation was suddenly heard, undoubtedly from a blasting. This only drove us on more, and paying no more attention to the Poles firing at us from gardens and alleys, it was our single purpose to reach the bridge on the San. With constant fire on the Poles wading through the San on both sides, we reached the bridge, unfortunately already blasted. Under the collapsed portions there still were dead and seriously wounded Poles and horses, as well as automobiles that had gone down in the collapse of the bridge.

The squadron leader ordered the light machine-gun squad which was available for use to cross the San in small fishing boats that were fastened at the bank and to set up a bridgehead. For lack of oars, slabs of stone were used. For the machine-gun platoon drawn up on the bank of the San in front of the blasted bridge, there appeared many favorable targets in the Poles fleeing through the meadows.

The detachment commander, who immediately after reaching the bridge had come up to the latter, shouted while moving ahead, "in the railroad station is a transport train about to pull out. Cavalry gun-platoon and armored squad-car to the station immediately." They, ahead of the detachment commander, immediately

roared away; and behind them, the squadron leader with the quickly assembled 3rd platoon. The three armored squad-cars and the cavalry gun-platoon made use of a road running parallel to the railroad tracks and fired with extraordinary effect at the locomotive already under way. This locomotive was soon punctured like a sieve, enveloped in a cloud of steam, and forced to stop. From the freight cars, however, machine-gun fire was opened. In front of the now attacking rifle platoon there stretched the train crew, and soon their weapons were laid down. The railroad station was occupied and the freight train cleared and disarmed. There were about 500 reserves aboard under orders to appear at Przemysl on 10 September. Soldiers had been provided as the accompanying crew.

While this was taking place at the railroad station, the platoon continuing through the city in the direction of Jaroslaw was heavily attacked by a Polish counterthurst. The detachment commander immediately brought in another platoon. Quickly the guns of the attacked batteries opened fire, and in their fire and that of the two rifle platoons the counterthrust was soon crushed. Not satisfied with this, however, both platoons went off after the enemy in the direction of Jaroslaw, and in their impetuous pursuit could only be intercepted by the order of the commander at Ostrow.

Since counterthrusts from all directions were to be expected at Radymno, the detachment commander directed a watch on all sides by the entire detachment now assembled.

The commanding general, who arrived at the bridgehead at 10 AM, took the hand of the detachment commander and said, "Forcing of the crossing of the San and creation of the bridgehead at Radymno are of as much value as the fall of Warsaw."

In the meantime another transport train, also with soldiers and reserves, had started toward Radymno. It experienced the same fate as the first one. Two other railroad trains coming later were captured by our supply units and other portions of troops.

On the other side of the San at about noon the enemy tried another counterthrust, apparently for recapturing the bridge. The attack was noted in time and thrown back by the light machine-gun squad that had been sent across. In front of units that had been landed in the meantime and were broadening the bridgehead, a cavalry rifle regiment drove the enemy in the direction of Jaworo.

The shelling of the city and meadows along the San, where many Poles were still in hiding, continued throughout the day, and the number of prisoners assembled in the principal square rose to 2,000 with uncounted losses in machine guns, rifles and fully loaded supply automobiles.

A counterattack constantly expected from Przemysl, only 15 kilometers (about 10 miles) away and still in enemy hands, did not develop. In the course of the afternoon the detachment moved out of Radymno and was sent to Sosnica for security against Przemsyl. There it was granted a day of rest.

The corps order of the day on 11 September stated: "I express to the mixed detachment which in determined persistence was the first to reach the San on 10 September, my full appreciation."

The leader of the army on 2 October also expressed to the detachment commander and to the leader of the squadron his thanks and appreciation.

Destruction of Enemy Front Line by Aviation

[An article in *Krasnaya Zvezda* 16 May 1942. Translated from Russian at the Command and General Staff School, Fort Leavenworth, Kansas.]

In a certain sector of the front our aviation was assigned the task of destroying enemy defensive works situated on a hill. According to the plan of action, aviation was to have been employed both day and night. This was to take place in a steppe (prairie) terrain, devoid of any orienting points. The enemy was protecting this region in daytime with fighter aircraft of the "Messerschmitt-109 and Heinkel-113 types. The enemy also had a great number of antiaircraft artillery and machine guns of all calibers. In order to execute the battle mission it was necessary, first to establish targets correctly, organize target indication on the terrain and to establish procedure for the recognition of our own front line positions, especially at night; second, to organize protection for our own air forces against enemy fighter craft and to silence his antiaircraft fire.

There was no opportunity to make aerial photographs of the entire sector in which action was planned due to lack of time and because inclement weather prevented our aircraft from rising to altitudes necessary for aerial photography. Therefore, the locations of enemy dugouts, trenches, mortar and gun positions were indicated on maps according to data obtained from available individual photographs and artillery bearings. As time progressed, targets were established from newly made aerial photographs and observations of plane crews.

The first line of the German fortified zone extended about 1.2 miles along the front. It was from 500 yards to about one mile in depth. The front line of resistance was about 250 to 350 yards from our front line positions. In order to destroy enemy fortifications in proper succession we agreed to divide the entire enemy position into three sectors: central, northern and southern. Bombardment was accomplished from altitudes of 2,600 to 4,000 feet. Targets were well visible from aircraft and therefore our bombing was accurate. The method of bombing was by aerial salvo in the daytime and individually at night when flares were employed. Bomb caliber varied.

The field of action—as already pointed out—was protected by enemy fighter aviation and strong antiaircraft elements. Therefore, each of our groups of bombers was preceded at a short interval by attack aircraft which was to silence enemy antiaircraft fire and engage individual machine-gun and mortar nests. Bombers engaged in the destruction of enemy dugouts were protected by two groups of fighter aircraft. One group, which was the group of direct protection, proceeded with the bombers at all times and did not enter combat immediately. The second group, which may be called the repelling group, engaged enemy fighters in aerial combat, preventing them from reaching our bombers.

The enemy offered fierce resistance to our aviation. It is natural that every bombing raid was accompanied by aerial battles. However, these battles developed only when our bombers were turning back after having unloaded their bombs. The reasons for this were as follows: The time of our air raids was never known to the enemy. The Germans were constantly patrolling the air. But the patrolling twosome or foursome of Messerschmitts did not risk attacking our compact formations. In attempting to stop the bombing, the Germans would send up an additional ten or twelve fighters but these usually arrived too late and attacked our group as it was turning away from the target or from the rear. In order to counteract this enemy action our attack and fighter planes raided the nearest enemy airdrome. This raid was one of the measures assuring successful execution of the main mission.

Special attention was given to methods of recognizing our own forces. Inasmuch as targets were but 250 to 350 yards away from our positions the strictest precision was needed. This was organized by air liaison officers assigned to ground units. In the daytime our front line positions were indicated by cloth panels in colors agreed upon and by colored flares which were fired in the direction of the enemy. At night it was necessary to employ more complicated measures which fully assured safety of our forces and guaranteed the precise location of targets by our bombers. All this enabled our aircraft of all types, including the heavy ones, to act against the enemy at night at a distance of but 350 yards from our positions. These same measures served, quite naturally, for target indication, as they gave our aircraft the limits of the sector and oriented the crews as to location of targets. In some instances we used artillery. Thus our artillery was firing at night on dugouts the bearings of which were accurately determined. This helped our aircraft in unloading their bombs with precise aim.

Of course the enemy tried to counteract our night raids. They fired on our antiaircraft searchlight. However, during the entire action the Germans fired but thirty rounds at our searchlight, and their fire was confused, the nearest hit being some 300 yards from the searchlight This can be explained by the fact that one of our light bombers was patrolling all night over the region of German artillery positions. The Germans feared to disclose their artillery dispositions and were silent.

It should be noted that our aviation discharged the mission assigned to it rather well. This was attained, thanks to a correct distribution of previously reconnoitered targets and the exact recognition of our forces both in the daytime and at night, and due also to the fact that air formations were well conceived so that flexible cooperation was realized between bombers, attack and fighter aircraft. By means of aerial photography and ground reconnaissance it was established that our bombers demolished eight dugouts, destroyed and silenced German artillery in firing positions as well as overlapping full-profile enemy trenches. During the entire action our aviation suffered no losses from

antiaircraft fire. Five enemy fighters were destroyed in air battles while our losses consisted of one bomber and two fighters.

It would not be beside the point to outline certain shortcomings discovered during our aerial action. Thus, for instance, our attack planes did not always retire from action in an organized manner. Some flights of three planes, and at times individual ships, delayed and later returned independently without protection. On the return flight the formation of attack planes stretched out, which made it difficult for fighters to give them protection. In addition to this, our attack planes were too fascinated by action against enemy machine-gun emplacements and infantry in their trenches. Their mission, however, was to silence the antiaircraft, machine-gun and artillery fire. Not until after the departure of bombers was it meant for them to attack other targets.

At times our bombers also made an error. When leaving targets, their groups stretched out due to the fact that the leading ships could not withstand the necessary speed. Without fail this violated the sureness of protection and complicated matters for our fighters.

It is clear that all the lessons of this instructive operation should be taken into consideration in preparing further aerial action against the enemy front line of resistance.

Tank Alert

[An article in *The Journal of the Royal Artillery* October 1942.]

In spite of the marked improvement in the general standard of antitank shooting by 25-pounders—due to the inspirations of those in authority and the perspiration of those who are not—it is an undoubted fact that the average standard at home is still not as high as it could be. In service 25-pounder batteries there are generally two reasons for it: possibly mediocre instruction and, more usually, the allotment of unduly large periods of the training program to other necessary matters so that the time available for antitank training becomes either beautifully less, or worse, suffers from lack of continuity. For once the weather cannot be blamed, as this type of shooting is both an outdoor and an indoor sport.

There is no lack of guidance in these matters. But in tank shooting there is a greater need for cold common sense than in any other form of field artillery training, and in the writer's opinion there has been rather too much theory, not all of which has been sound. Given the time and the continuity, any half dozen good BC's will arrive at a reasonable standard of hits if left to their own devices. It is, however, a bugbear of training that there never *is* the time; and BC's are rarely left alone for long, as they are necessarily part of the divisional machine with other urgent calls on their time. Faced with this in his own unit, dissatisfied with the standard of hits obtained, and determined to get something better, the writer devoted a good deal of his leisure to the matter and hopes that the methods used may be of some assistance to his brother officers faced with a similar set of circumstances.

The percentage of hits obtained at practice by the regiment has been 23. The known time available was three weeks, two of them interrupted by short exercises but available in part; the third, a blank one, was dubbed "Anitank Week" in the hope that by going flat out then, everyone would get maximum value through doing nothing else, and so work up to a climax. All hands were to take part without exception; as a result the cooks and batmen promptly copied those grand men of Tobruk and formed their own Bush Artillery; by their enthusiasm, they inspired the others to take the greatest interest in what was hoped would show tangible results on the battlefield, and a financial profit at practice camp. Human nature being what it is, the latter thought was probably uppermost. There was no time for detailed instruction; so the "course" had to be of an intensive refresher type; and though first class shooting was the main item, good all round knowledge was also necessary.

That hard ridden hunter "Appreciation" went over the course first; and the obstacles were soon jotted down as

i Hitting tanks.
ii Only hitting enemy tanks.
iii Where to hit enemy tanks.
iv Concealment.
v Tanks versus gun tactics.
vi Battle drill competitions.

In order to get results on the same lines, all the key lectures for officers and No. 1's were given regimentally; directives were issued to keep training programs together, and gadgets, posters and so on were made good common property. The QM "found" a most useful stock of SAA, including some tracer; and a range roster was made allotting SAA ranges in the sand pit, the Vaudrey, and best of all the pond, to each troop in turn. Without further ado we copied Sam and "let battle commence," making 50% of hits the standard.

Hitting tanks.—It was soon found that provided the drill was kept on orthodox lines, certain aids to tanks shooting were unnecessary; so all sorts of quick firing straps, knuckle rammers and so on went into the discard without regret. "Point of aim, consistency, quick change of target" were well hammered home, and the cardboard tanks soon showed that we had found the first flaw—weakness amongst No. 1's in correcting and also in judging distance. In spite of all we did some No. 1's improved so slowly that they spoiled the layers; so a special class was run in each battery using first a blackboard and then the pond, until, by sheer grinding hard work, they really could order a deflecion or correction which meant something and one which was quickly yet clearly enunciated instead of gabbled, or worse, muttered. Distance judging was taught by getting the surveyors to set up a bearing picket and panorama in the center of the gun park, fortunately endowed with a view, and taking small squads over in turn. A good deal of trouble was taken to demonstrate, by using suitable posts and by shooting, the relationship between deflections and their distances on the ground. There was a surprising lack of knowledge of these essential values, and it undoubtedly accounted for some of the earlier indifferent shooting. Known points were fixed on the moors, and instead of marching drill, distance judging rambles were held and afforded useful variety. Penny sweeps were allowed, and the look of pleasure on the face of the winner of a small handful of copper was well worth walking out to see.

Much ingenuity was expended on varying the runs and on bobbing targets; and the stop watch soon showed up the next weak spot, that of "one quick hit" as it was labeled. Constantly it was found that the quickest layers required two shots to get one hit, while the more deliberate took one shot but too much time. It was explained that once the gun fired at a tank, it had in all probability given away its position. On the other hand there was by no means a guarantee that even a well hidden silent gun would not be spotted by the tank or the tank artillery observer, who would be looking out specially for it. Therefore a quick and certain hit was of prime importance, "or else." This point appreciated, "one quick hit," was tackled methodically and intelligently with quite gratifying results, though it gave a lot of trouble at first. A good deal of ammunition had been fired on normal role shoots, and the loading therefore was not in question; zeroing was then unknown, but the necessity for careful sight testing had already been well rubbed in. The effect of varying light upon the target was explained by sitting in a dark room and showing a target in the different lights obtained by changing the colors of the bulb. This was rather a crude method, but impossible to show in any other way as mother nature usually took too long over it or staged it at inconvenient times. After this it soon became obvious that continuity of training was the only thing that mattered as far as the laying went.

Only hitting enemy tanks.—Lovers of identification of tank tests all had their pet theories as to how it should be taught. Concensus of BC's opinion was that to make a good quick job of it we had only to know our own and shoot all others; but there was a cry of protest from troop commanders who hated the thought of throwing away what progress had already been made in recognizing their favorite Pz. K.W. So it was agreed that identification would be based on our own tanks plus salient features of the enemy, keeping to plain facts. For those who like mnemonics "ATA. AT" was thought up and used for

A ppearance
T urret
A erial

A rmament
T racks.

"*Appearance* of three points" came from studying the available models and photos, as well as pictures cut from the illustrated papers. Visits to the next-door tank regiment did a great deal of good as they very kindly lent us all their models and pictures, which were both interesting and varied.

Turrets were grouped roughly as being rounded for most, though definitely not all, British and U. S. tanks; and box shaped for the enemy (except the Pz. K.W. VI, for example, which is of course round). If a tank came at you with its turret gun turned to the rear (engaging the enemy) it was either one of ours or an enemy playing a trick, and further identification was necessary before making up one's mind.

Aerials on the turret for the British, and away from it for the enemy—some pains were taken to show that dangerous catch, the aerial behind a turret at such an angle that a Nazi may be mistaken for a British tank in a poor light. Identification pennants flown from aerials were mentioned briefly.

Armament was left at the fact that enemy gun jackets are usually thicker looking than ours, and built up in layered steps making them easy to identify.

Tracks were taught as simply as possible, emphasis being laid on the uneven spacing of our bogey wheels and the even spacing of those of the enemy; plus the fact that the link bar and scissor types of suspension are all enemy.

Where to hit the enemy tanks.—Again recourse was made to catch phrases, and

(a) "Hit 'em in the slats"—made it clear that a side hit in the suspension, or on a track, was a knock-out.

(b) "Kick 'em in the pants"—was promptly vulgarized into more robust English which can be guessed by the reader. It emphasized the fact that in rear of the tank was the engine and petrol, not over heavily armored, and if the chance came, it must never be neglected.

(c) "Punch 'em on the jaw"—The thickness of front armor was shown; but over-emphasis had, it was felt, been laid on the extreme difficulty of knocking out tanks frontally when out on exercises; so it was explained that it was possible to do so with great effect as long as the outer thirds of the target frontage including the tracks were shot at. A slight and harmless variation of the theory of aiming at the "center of mass."

By treating the subject of hitting tanks in terms of humorous contempt, it was hoped that the detachments would bite on the familiar catch phrases when their testing time came, and so lose that awe of tanks which the uninitiated are apt to feel in their first antitank battle.

Concealment.—Much of this was already known, but further attention was paid to shade and its effects and the use of the gun net to fix foliage so as to break up the ground observer's view. The need for a field of fire defiladed from the front to get flash concealment was gone over again; and the effects of blast marks on dry grass and on snow were discussed, as these tell-tales are a certain give away. Making the detachment keep absolutely hidden and still for any length of time was the hardest lesson of all to teach.

Tanks versus Gun tactics.—Thanks to some Canadian friends, their tank battalion came in whole heartedly on the antitank week. Their CO lectured on the attack of an area by tanks, took part in an antitank TEWT and rounded it off by making his training scheme fit ours, attacking the regiment which had been deployed in a 50% normal role. We were rather surprised and interested that the tank officers' verdict was that they felt sure their troops, acting with one stooge tank forward and the other two back (the guns had deliberately let their light reconnaissance cars go through) would knock out most antitank guns sooner or later, but that attacking the normal role gunner troops was pretty fair hell as they are less expected. The gunners, who were firing SAA, were, on the other hand, delighted at the size of these "real" targets and the jeer was heard later—"you couldn't hit a haystack—why I don't even believe you could hit a tank."

Hull-down attacks were then practiced as a second phase in the scheme, and the men saw the value of bobbing target practice for the first time. A tendency to fire at the very slightly exposed part of a turret showing behind a bank needed consideration. It may pay to shoot through the bank itself. Or, it may be a trap to get an unwary or jumpy detachment to expose itself without hitting, and this is followed by an attack by the "hornets" whose machine guns make life most unpleasant for any detachment. The tanks all reported unfavorably on the drill positions of the No. 1's who they said could be seen quite clearly and would not have lasted for long. The drill was therefore made more realistic by making No. 1's stand or crouch in a camouflaged slit near the gun just clear of the flash, but near enough for control and correction purposes, the slit ending at the near wheel.

The need for glasses by No. 1's was got over in some cases by examining doubtful tanks through the layer's telescope, 3 changing over with 1. This is often not possible, and 3 should be taught to quickly identify friendly tanks so that, if No. 1 is in error or doubt, he can assist by calling out points for identification before the tank closes the range.

Battle Drill Competitions.—These took place partly at practice camp and partly over rough country. Competitions were organized on a troop basis and small prizes for detachments were offered. The cooks and batmen were allotted a special event known as the "Dough Boys' Stakes," and very seriously it was taken too. The first or practice competition consisted of an 80-mile march to camp, bivouac, and shoots next morning at jinking targets varying from 400 to 1,000 yards. This could only be marked on a troop basis. In spite of the apparent evenness of all troops with SAA the percentage of hits worked out at just under 60 for the best, and 35 for the weakest, some of it under varying conditions of light; but the object—that of an average of 50% of hits—was pretty well achieved. The second competition consisted of hiding a gun detachment on the edge of a wood, and after judging it for camouflage effect, man-handling it over a ditch and down a slope against time, and then firing SAA at a hull-down tank only to be seen from the finishing line. All competitions took place in F.S.M.O, no allowance being made for the weather, come what may.

Conclusion.—There is no doubt that where BC's are worried by difficulty in improving their percentage of hits, an "antitank week" will certainly make a marked impression, even on their most backward men. But it must be followed up by reasonable continuity of training for the No. 1's and layers, and for another antitank week set aside once a quarter. There is then no apparent reason why 50% of hits should not be their minimum standard under average European conditions; and anything less, on a second front when it comes, is not likely to do very much good.

Leadership of Pioneers

And Their Cooperation with the Other Arms

[From the German *Taktisches Handbuch für den Truppenführer und seine Gehilfen.* Translated at the Command and General Staff School, Fort Leavenworth, Kansas.]

The combat engineer officer must try to foresee the needs of the troops and meet them in advance.—Moltke.

The combat engineers are the technical combat troops of the Army. It is their duty to prepare the way for the other arms in special and difficult circumstances. They play a decisive role in river crossing operations, overcoming obstacles, attacking positions and fortifications, and in combatting tanks.

Employment of combat engineers at the same time increases infantry fighting power. But as a rule they may be employed as infantry only when other forces are not available. Combat engineers are difficult to replace. When used on infantry missions, combat engineers should be reinforced by heavy weapons according to the need.

The combat engineer tactical unit within the division is the battalion; for smaller units it may be a company; and in exceptional cases, a platoon.

On the march combat engineer units are usually allotted to the advance guard. When necessary, parts of the bridge train are assigned to the units allotted to the advance guard. Combat engineer foot elements which are not used with the advance guard are generally included in leading units of the main body. In deploying when it is necessary to remove obstacles and hindrances, combat engineers are frequently subordinated to the different infantry and artillery units. This alone frequently makes it possible to make an engineer main effort. In order that combat engineers may have enough time to prepare for employment, their commander must be promptly informed of the intention of the commander under whom they are operating.

Time required for preparation depends upon the nature of the engineering work required. The amount of time required for preparations increases as more use has to be made of emergency equipment instead of equipment prepared in advance.

The commander of the unit to which combat engineers are attached assigns a mission to them. How the situation is to be accomplished is decided upon by the commander of the combat engineers.

The combat engineer commander must always adapt their employment and his choice of means to the changing situation. He must also make proposals for the employment of his unit well ahead of time.

The combat engineer commander must not neglect to make preparations, especially of a reconnaissance nature, for a possible employment of his troops (or he must be ready to have such preparation made) even when it is not certain that his men will be employed.

Breaking up combat engineer units reduces their effectiveness considerably. Only in exceptional cases is less than one company employed on a given task.

In combat missions engineers coordinate their actions closely with the arms

with which they are to cooperate. Whether pioneers are to be subordinated to other combat units for definite tasks or whether individual arms are to cooperate with the pioneers depends upon the situation in each case. When large obstacles are encountered in an operation, attachment of other arms to a combat engineer unit may be advisable. Occasionally the engineer main effort coincides with the tactical main effort.

As soon as the situation permits, the combat engineer commander must make every effort to reunite under his own command any elements that have been detached.

Prompt establishment of communication is of greater importance for the unified command of combat engineering units operating in a large area. It may be necessary to assign signal units to reinforce combat engineering signal platoons.

Combat engineer-communication units assure communications within the command as well as cooperating with the other arms (especially in a tense combat situation).

It is always desirable to withhold reserves of engineer personnel and equipment, but often this is impossible until after action has begun and units which have been engaged have been released upon completion of their tasks. Reserves are necessary:

1 in order to replace losses,
2 when the situation is uncertain; and
3 for special missions.

In most cases it will be possible to withdraw engineers already employed in order to assign them to more important duties. Motorized engineers may be used even in remote places (over great distances).

The supply of engineering matériel must be initiated early, especially if it first has to be brought forward and assembled. Engineering equipment frequently requires large loading space.

Bridge-building and construction detachments are used for building bridges and roads in rear areas.

On What Does Success Depend in Russia?

Lessons learned by an Officer in the Eastern Front.

[An article in *Militär-Wochenblatt* 28 August 1942. Translated from the German at the Command and General Staff School, Fort Leavenworth, Kansas.]

This article is important in that it once more confirms, this time by the Germans themselves, the stubbornness and effectiveness of Russian resistance. Admitting, as it does, the multiplicity of difficulties encountered by the Germans in their apparently futile effort to eliminate their Soviet adversary, the article carries more than a suggestion of the various vicissitudes experienced by the invaders. Things left unsaid are thus as important as those brought out into the open. Above all, the article tends to attest to the truthfulness of reports of heavy German casualties.—THE EDITOR.

1. *One must be a hunter.* The German soldier in Russia is faced with an adversary who, culturally, is not his equal by birth. The greatest advantage possessed by the Russians is in their highly developed animal instincts and their lack of sensitiveness to climate and terrain. If we are to conquer them, we must be at home in woods and swamp. We must be able to find our way by night and in fogs as easily as in broad daylight. We must be able to stalk our enemy and creep up on him as a hunter on his prey. We must be able to build a shelter for ourselves in the woods. Whoever, therefore, desires to train soldiers to fight against Bolshevism will go out with them into the nearest swamp land where he will train them day and night, summer and winter.

2. *One must be able to improvise.* The Russian is a master of improvization. He drops artillery shells from gliders; he immediately puts captured weapons to use; he hurriedly gathers collective farmers together into troop units, equips them with horse carts and tells them to find their arms in the woods. He has crossed over broad rivers on pneumatic rafts when he had no other means of crossing. He hurriedly loads reserves into commandeered trucks and sends them into battle. We have learned from him. In the summer we motorized our supply columns; in the autumn we carried our supplies to the front by means of porters, in the winter by means of sleds, in the spring by the use of horse carts. We learned to build portable quarters of plywood. We made pack animals of cart horses. We built corduroy roads through marsh lands when the highway was in the hands of the enemy.

3. *We must learn to be tirelessly active.* The Russian is not naturally industrious, but he is given no rest by the commissar system which gets out of him all there is to be had. Scarcely a day passes that the Russian will not attempt an attack, be he ever so weak. He works every day at improving his positions, builds roads and fortifications in places where at the moment no attack is to be expected. We even found strong fortified positions east of Leningrad with the front to the east. The Russians, therefore, must have counted on the encirclement of the city since the beginning of the war and made preparations for it. When a fight lasts for a considerable length of time, the German soldier becomes slack. How much blood can be saved by working every day on the position. Also by working at it every day, the shelter can be made more comfortable, more dry and pleasant. How much vehicles can be saved if one will work on them constantly; how much other material can be spared if camouflage is erected to keep it out of sight of the enemy, etc. It must be clear to the soldier who comes to Russia that it is not an indication of cowardice to work on the position, but an obvious duty.

4. *One must be suspicious of people.* As far as possible, the Russian employs cunning and trickery in his fighting. Destruction lurks in a thousand places, first of all with the Russian civil population which under no circumstances must be trusted no matter how innocent they may appear to be. Prisoners, especially the young, are completely sold on Bolshevism. They are capable of any treachery. In battle itself mines, camouflaged suits, ambuscades, etc., plays a great role. Only a person who is accustomed to being always closely on the watch will escape these threats.

5. *One must be wide awake.* The Russian attacks almost exclusively at night and during fogs. He is constantly surprising our troops. In the front lines there is no other way than to watch at night and rest in the daytime. Where the terrain is close, detachments in the rear often pay with their lives for lack or insufficiency of guards. In the usual sense of the words, there are no front lines and rear areas in Russia. Any one who lays his gun aside east of the old Reich frontier may greatly regret it the next moment.

6. *Reconnaissance.* Reconnaissance saves blood. The Alpha and Omega of all fighting in Russia is reconnaissance. Only by good reconnaissance is it possible to learn quickly of the Russian intentions and take proper measures to neutralize them. Casualties resulting from reconnaissance are surprisingly few. In Russia it is necessary for the soldier to be trained to the utmost in scouting, observing and listening.

7. *Food supply.* On account of difficulties presented by the terrain, feeding the men is an extremely difficult task. It requires both dependability and versatility on the part of the men entrusted with this duty. Breaking an axle or failure of a horse are no reasons why the vehicle should remain behind with the much-desired food. All means must be employed to get it on. All men, including the master sergeant in charge of bringing up the food, are expected to bring the vehicle ahead even through enemy fire. Service with a field kitchen is no sinecure.

8. *One must be clean.* Any person who does not take care of his body with the greatest faithfulness, conquering all tendencies to indolence, will become utterly degenerate. There is no excuse for not bathing daily. There is plenty of time always and in all places, but there is no scarcity of water. But indolence must steadily be overcome. Cleanliness has always been and still is the greatest remedy against vermin, but it makes its mark inwardly, also, and gives him the sense of being a cultural man in contrast with the Russian population.

9. *One must be hard.* It takes real men to stand war in temperatures ranging from 104 degrees above to 40 degrees below zero, knee deep in mud or in heavy dust. Casualties resulting from the Russion mass attacks often present pictures to the young soldier against which he will have to fortify his heart. He must count on the fact that he may lose his own life and be reconciled to it. Only men who in the hour of death do not lose their composure are able to stand battle against the Russians. Weak natures must be made to realize the fact that leadership is hard enough to punish cowardice with death. It is only in this battle between these two world philosophies, in the attacks of Red weapons, that one becomes conscious that the life of the individual counts absolutely for nothing in this war.

10. *One must be a comrade.* Those things which have appeared impossible to those who are not participating in this war are only accomplished by the comradeship of the German soldier. The hardness of this war wields an iron band about officers, noncoms and men. This, however, requires from each of them, especially from those who have but recently joined the ranks, the immediate task of getting rid of all peculiar or undesirable traits. It is only possible for one to exist here by entering wholeheartedly in the union of comradeship, casting aside all individual traits; by being willing to divide the last piece of bread with one's comrade and to shield him at the cost of his own life. One will become strong then and be able to satisfy the requirements of this war.

A Polish Sapper and Miner Company in Action

[An article by Lieutenant K. Bilski, Polish Engineer Corps, in *The Royal Engineers Journal.*]

Lieut. Bilski's Company was attached to the 10th Polish Motorized Cavalry Brigade.

The sapper and miner companies formed by engineer troops in the Polish army several years before the present war were mainly intended to oppose armored vehicles by means of antitank mines and demolitions. Their mission was mainly defensive. They formed part of engineer battalions of armies or mechanized cavalry brigades, or of some infantry divisions.

The accompanying sketch shows the establishment of the company, from which it will be seen that it was equipped to carry out the following tasks:

1. The demolition of roads, bridges, etc.
2. Laying mine fields.
3. Antitank obstacles and traps.
4. Destruction of fords.

of fords. This was done by driving special pipes into the bed of the stream, pumping water down them until suitable chambers were formed for the 7-lb. charges, whereby craters of 4 yards in diameter were obtained. The technical platoon, besides the high explosives and fuzes, carried sufficient fuel to supply the company for a 320 mile march. Owing to the light type of its vehicles the company was very mobile.

The company whose action I am about to describe had been under my command for two years and remained so during the whole campaign. Two weeks previously it was attached to the 10th Motorized Cavalry Brigade. This brigade, as a covering unit, was awaiting the outbreak of hostilities in the environs of Cracow.

On 3 September when it first went into action, the company was billeted in the forester's house at Pcim. On the preceding night three mining and two reconnaissance patrols had prepared for demolition and laid out mine fields at 1, A and B, (see Map 1) and at each object firing posts, each two men strong, were detailed.

That morning my company received orders to prepare demolitions and lay out antitank obstacles in the Jordanow-Tokarnia and Krzeczow-Lubien areas, held respectively by our 24th Lancers and 10th Horse Rifle regiments. Special attention was also directed to the Pcim region, where the conditions for very important demolitions prevailed.

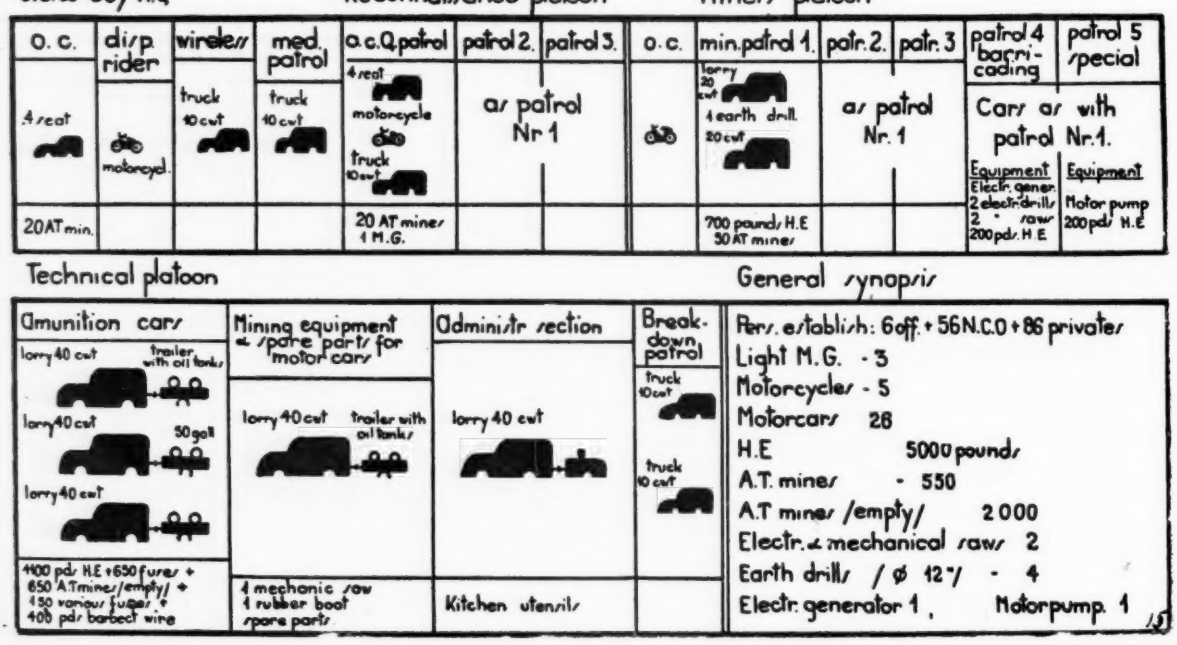
The order also stated that the engineer working parties were to be covered by the fighting troops, that the demolitions in the Letownia and Lubien areas must be ready for firing before 2 PM, and that the commanders of the fighting troops had been given general information about the demolitions.

It will be seen from this that the time allotted was very short and that, as the enemy was fully motorized, the number and quality of the demolitions might materially influence his speed of movement. The reason for the special importance of the Pcim region was that it was the point of junction of many roads from the south. Demolitions at that point would obstruct the only road leading north to Myslenice and Cracow.

Owing to the limited time at our disposal, normal reconnaissance was impossible, and I decided to distribute my working parties from an appreciation of the terrain as shown on the map.

I consequently sent to each area an officer with one reconnaissance patrol and two mining patrols. In order to insure a rapid supply of high explosives I sent two truck-loads to the bridge marked 7c in Map 2. As I expected that there might be a further retreat on the following day, I sent a patrol to reconnoitre the Pcim-Myslenice line.

Scheme of the organization of a motorized sapper-miner company



The reconnaissance patrols had, besides their normal duties of engineer reconnaissance, other tasks:

1. Passing information between tactical units and the demolition parties working in their area.
2. In many cases the decision when to fire the charges.
3. Covering the demolition parties when working independently of tactical units.

A Mining Patrol was organized to work at five different places at once. An abatis patrol, with its mechanical equipment, was capable of constructing an abatis in a wood, armed with mines and traps, about 50 yards long, in about 2 hours. The special patrol, with its motor pump, was mainly intended for the destruction

About noon I received information that the demolitions numbered 2 and 4 on Map 1 would be ready before 1 PM, and that my demolition project for the eastern area had been accepted by the commander of that area.

In view of the importance of the Krzeczow-Pcim road, I accompanied that patrol myself in order to judge the probable effectiveness of the proposed obstruction. I found that the bridge near Tenczyn (No. 3 on Map 1) was not very important, as its demolition would cause only about two hours' delay to enemy motor-cars and cycles. The bridge near Lubien appeared to offer more favorable prospects. With the bridge demolished and a mine-field laid on both sides of the road it might be hoped that the enemy

advance would be checked for a considerable time. His motorized infantry and tanks would then be obliged to make a detour over the mountain slopes which would be very advantageous to us. The bridge could not be reconstructed under 4 to 6 hours. But the bridges at Pcim (see Map 2) were far more important. Demolitions and obstacles carried out there would effectually hold up the enemy's advance, and the terrain offered good conditions for the defense of the obstacles. I anticipated that the enemy might be halted there for as long as the defense could resist them, and even then the reconstruction of the bridges would require some considerable time.

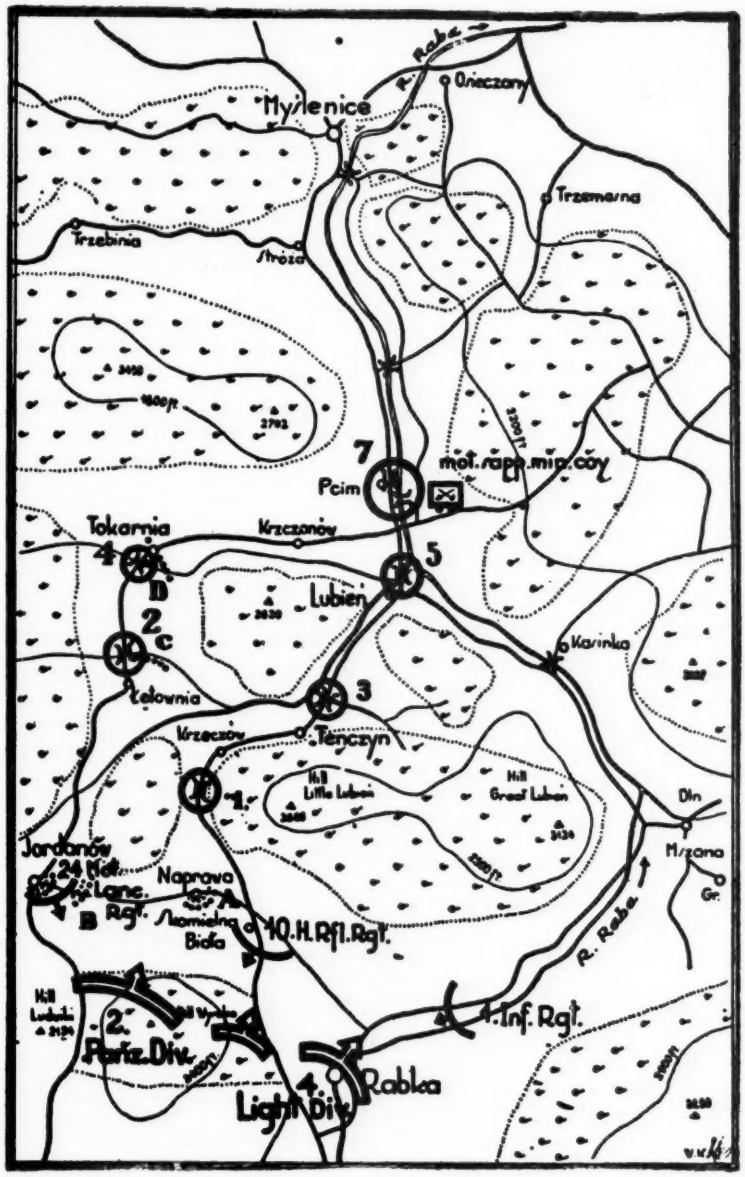
The mining patrols began with the work on Nos. 3 and 5 (see Map 1) and finished by 4 p.m. The work was delayed by the want of proper drills. The stone embankment made the use of our drills ineffective. Pneumatic drills would have shortened the time by one-half. It was only possible to bore drill-holes and successively fire in them 4-lb charges of trotyl. In this way after three hours' work 6 shafts of sufficient depth were ready, and the normal charges of H.E. had to be doubled. The main charges on bridge No. 5 were 240 lb. each.

During the morning I presented the commanding officer of the 10th Horse Rifle Regiment my scheme of demolitions in the Lubien area. He did not agree to the mine-field at the bridge, as he was afraid of not being able to inform his fighting units of its existence. All the other arrangements were approved. He ordered me to place warning posts at the mine-fields Ei and Eii (see Map 2) and to leave them until dark. He added that during the afternoon he was going to organize a second line of defense on the heights 2702 and 2450 north of Pcim in order to cover by fire all the projected demolitions. The order to fire the charges was to be given by the commanding officer of the brigade reconnaissance tank platoon, which was to be the last to retire. It would however be advantageous if one of the engineer officers could establish contact with him and explain the arrangements. I sent the commander of my company reconnaissance platoon on this mission. On my way back to the company I informed the sappers at the various posts of the general situation and the arrangements for firing the charges.

I decided to remain for the rest of the day at the Pcim bridges, where the last mining patrol was working. It was an excellent post for the company commander as the traffic passed that point from all directions, including the dispatch riders and the returning mining patrols of my company. By questioning dispatch riders and passing officers I was in a position to gain the latest news from the battlefield and by this means to control the work of the engineers.

About 2 PM the enemy delivered a strong attack on the Lubien heights, slowly driving back our troops towards the north. A sapper who passed reported that the bridge at Krzeczow, of which he had been in charge, had been blown up. A few hours later I learned from another sapper that the bridge at Tenczyn had also been demolished. They had experienced great uncertainty as to when to fire the charges, as they had not seen our tank commander nor received orders from anyone else, but when the enemy were only a few tens of paces distant they had fired the charges on their own initiative.

About 6 PM the enemy were approaching Letownia and Lubien and our troops, retiring in motor-car columns along the highway, became more and more numerous. The mining patrols from both areas began passing, reporting that their work was ready. The officer whom I had sent with the eastern party reported that he had had a lot of trouble with our retreating troops, one section very nearly walked over our mine-field near Letownia, and near Tokarnia a peasant cart struck the road bridge (7c in Map 2) offered the greatest difficulties. The ground there was practically all rock. Again the shafts had to be drilled like mining and the charges increased four-fold. While talking to the battalion commander I had missed seeing that the western wing of the mine-field was being made too close to this bridge, so that the blast of the



MAP 1

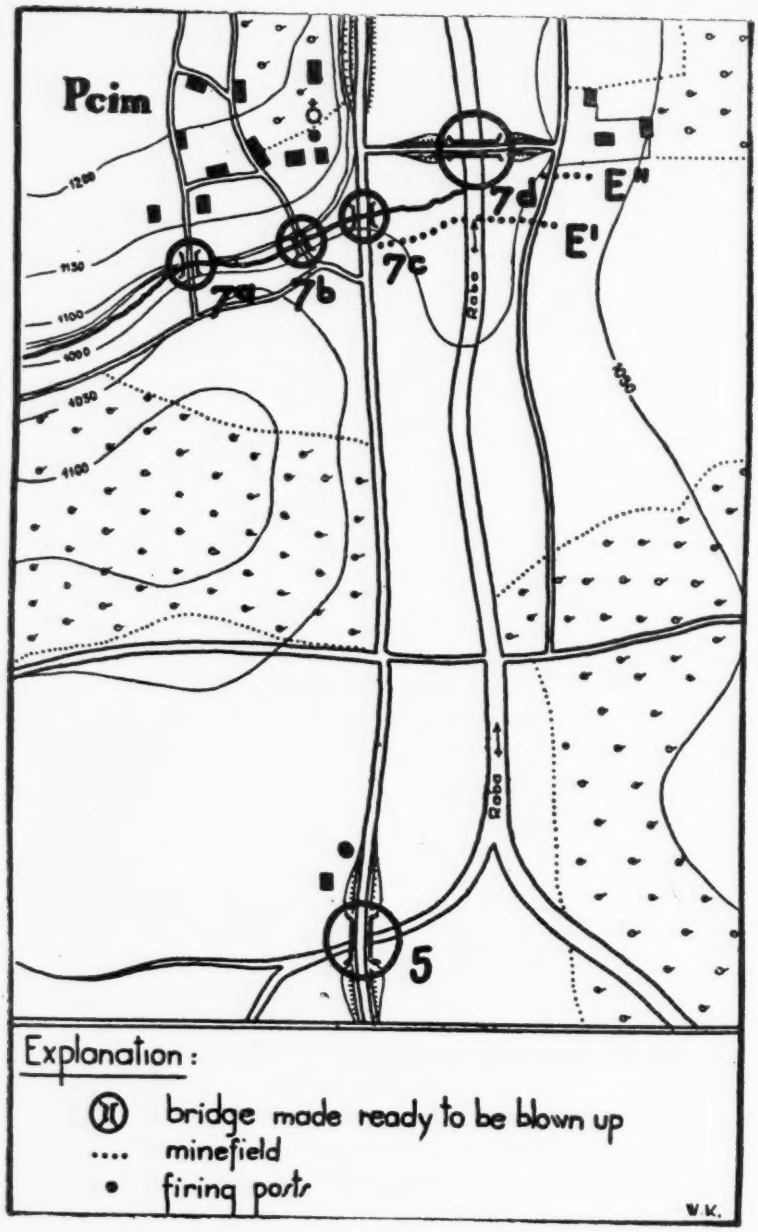
our mine-field, marked D in Map 1, owing to the negligence of our warning picket. The mine-field had been reestablished and the inhabitants told how to avoid it. My battalion commander passed and asked me what objects had already been blown up, and he told me that in the morning German infantry passed over our mine-field in the Naprawa region. He had witnessed it from his observation post. The Germans as soon as they became aware of the presence of mines retreated helplessly.

In the meantime the works in the Pcim area were nearing completion. That on demolition might have destroyed several of the mines; I consequently moved the wing some 20 to 30 yards forward.

Meanwhile the sounds of battle were coming nearer and nearer and troops in small columns were retiring on both sides of the road to occupy a new line of resistance. I was awaiting impatiently the return of the officer whom I had sent to the commander of the tank platoon, for if he had failed to find him, the firing post at the Lubien bridge would remain without orders and this important communication might be left intact. Actually this officer never returned.

The fight was intensifying. The enemy twice attacked with light bombing aircraft. About ten planes took part in each attack and, firing from a height of from about a hundred to two hundred feet, machine-gunned our troops and bombed the roads. Several bombs fell near the bridge and one hit a motorcycle carrying two non-commissioned officers. The German artillery now directed a heavy fire against Lubien. It had evidently moved forward and was now supporting their infantry attack. Should they occupy Lubien the whole Jordanow road would come under their fire and it would be difficult to withdraw our firing post. To my relief I then heard a loud explosion in that direction and appreciated that they should still be able to join us.

The German artillery was soon directing its fire on the north side of Lubien and still the reconnaissance tank platoon had not arrived. I asked several officers from the front for news of it, but they could tell me nothing. At last I decided to go forward myself. Our units, apparently the last ones, were running out of the woods near Lubien, jumping into cars hidden in the village and driving off. The enemy directed his fire on the parking place, but all got away in time and none were hit. I was lying with our firing post in a ditch by the roadside. It was the first time that I had experienced a battle and as the cars passed I saw that the men were very exhausted, covered with dust, and some were wounded.



MAP 2

Again the enemy advanced his fire and shells fell in front of the bridge (7c in Map 2) that we were waiting to demolish. One fell so near that we were compelled to change our post. We hid behind a barn, but the thatch caught fire and the barn was soon ablaze. Again we had to move, this time to a shell crater, the men carrying the leads and I the powder. The men looked enquiringly. Should not the bridge be blown up? But our tanks had not yet come.

The Germans were now to be seen among the houses of Lubien, within 500 yards of us. Now, in turn, our artillery was directing its fire on Lubien. The Germans moved off eastward into the woods, but after a little time they renewed their advance towards us. Soon they would be upon us.

I was beginning to get anxious. Should I demolish the bridge or wait a little longer? If any of our tanks or cars remained at the front their retreat would be cut off. At that moment two tanks appeared from the west of Lubien, but were they ours? They were advancing on us, followed by two more just debouching from the woods. I ordered the key to be put into the exploder. We strained our eyes. They were ours.

The Germans opened fire on them, but it was ineffective. Soon they had reached the road. I signalled to them to stop and enquired for their commander. He was in the fourth tank. I asked him if I could now blow up the bridge. Apparently one tank was still behind, so that I could still get no reliable information. The Germans started firing on us, but they hit the last tank without damaging it and then wounded my corporal in the leg, seriously I found afterwards.

I still did not know whether to blow up the bridge or wait for the remaining tank. But the Germans were coming nearer. A few tanks appeared from the western outskirts of Lubien, and I saw shells, evidently our own, bursting near them. That cleared up the situation, our missing tank would not return. At last I decided to fire the charge. The bridge was blown sky-high—a terrific explosion—1200 lb. of high explosives. The hills reverberated with the echo. The sapper exclaimed with relief "All in order." Then we withdrew, and I realized how difficult was the task of a firing post under the circumstances.

The Germans occupied Lubien and the adjoining heights but did not continue their advance that day. Returning to Pcim I found everything in readiness. The cables to all the charges had been brought together into a common station and it was thus possible to fire them successively or simultaneously. The firing posts were on the alert. Dusk was falling. The sounds of battle grew weaker and with the first cold night breeze silence fell on the battle front.

The following conclusions may be drawn from our experience in the campaign in Poland.

(1) Sapper and miner companies organized and equipped as shown in this article are of value only in the defense. When supported by relatively small numbers of antitank weapons and infantry, they can check an enemy's advance for a time on any kind of terrain.

(2) Their equipment must be judiciously selected and adapted to their most difficult conditions of work. The specialization of some patrols, and even platoons, to a given kind of work, is not advisable. All should have uniform organization and equipment so as to be able to carry out every kind of task, whether demolitions or obstacles.

(3) The decision when to fire a charge is a very difficult matter. Soldiers charged with that duty should be instructed with the situation, and they must finally make the decision from information received from the troops in final contact with the enemy. They must be courageous, with plenty of intelligence and initiative.

(4) At all larger demolitions at least two men should be left as firing posts. The so-called "enemy hunting" may often produce disastrous results, as the enemy, if allowed to come too near, may kill the firing post and gain the object undamaged. Directly the demolition becomes possible it should be carried out without delay.

(5) Antitank mines should contain at least 2½ lbs. of high explosive for otherwise they are too weak to destroy tanks.

(6) Staffs of the larger units should carefully study the employment of antitank mines within their units, in fact all commanding officers of units of every description should understand the use of these mines. Principles for their use should be established in the whole army and rigorously observed.

(7) In a delaying action the ground conditions often make it impossible to bring fire to bear on completed demolitions. In such cases the defense should be reenforced by traps and mines.

Penetration

[Translated from a Russian article in the Red Army newspaper *Krasnaya Zvezda.*]

The German defense along the Mara River was the strongest sector on the whole Moscow front. This sector was generally believed to be a stable and quiet one, but as a matter of fact the most violent and prolonged battles took place here. Having been defeated near Yushkovo, the Germans took a position on the Mara River. When our troops undertook the offensive it was clear that to break through the strong defense of the Germans on a wide front was too difficult. It was easier to do this with strong forces on a narrow front.

This mission was accomplished by Erastov's division with the objective of penetrating deep into the enemy position.

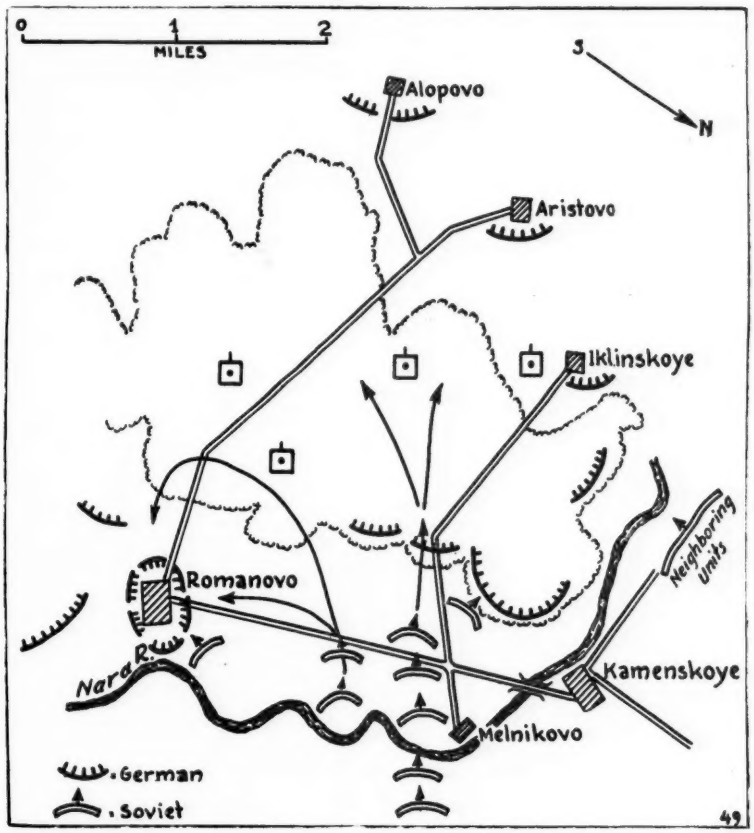
The enemy situation was as shown on the sketch. The strongly defended positions were on the left at Romanovo and on the right near Kamenskoye. The distance between these two points did not exceed two and a half miles. The Germans had dug their trenches near the edge of the forest, and areas between trenches were covered by enemy supporting mortars, machine guns and artillery.

The commander had to decide how he was to penetrate this position. Along the whole front—and dissipate his strength? on the right? or the left?

Between strong-points the areas were covered by an impenetrable fire. The division commander studied the terrain and dispositions from various observation points. Romanovo was located on an open spot, difficult to approach. It was apparent that the best approach was near the village of Melnikovo over which our observation was the best. By breaking through here and quickly moving into the forest it would be possible to penetrate to the enemy artillery positions. Also it was probable that the enemy fire power was weaker here than at Romanovo. The road between Melnikovo and Iklinskoye had an important influence—it was so tempting to have a road as the axis of movement, especially in a forest and in the winter.

The division commander made his decision: to penetrate the enemy defense on a narrow front with a determined infantry attack heavily supported by artillery fire. The place chosen was on our right flank which permitted heavy mortar fire to be delivered on the strong position to the southeast of Kamenskoye.

A glance at the sketch will show the scheme of maneuver. On a front of 700 yards was concentrated three-fourths of the infantry units which attacked in the direction of Meinikovo-Iklinskoye. Our division commander was determined on a concentrated effort. He took all measures to decrease the effectiveness of enemy strong points and against each he sent a battalion of infantry, supported



by artillery. These units had to guarantee the success of the main effort. The neighboring unit assisted by attacking the enemy left. His plan was to break through the defense on a narrow front in order to paralyze the enemy artillery fire in the rear.

The division was supported by artillery of all calibers which maintained close liaison between the artillery and infantry commanders. Each artillery battalion commander was right with the infantry commander. As action progressed it became necessary to attach heavy artillery to the infantry regiments in which case the artillery battalion commanders remained with the infantry battalions; but the artillery regimental commanders remained with the chief of division artillery who, in turn, remained with the infantry division commander. This close liaison permitted uninterrupted artillery support during the whole battle.

The division commander could communicate at any time from his observation post by telephone with the infantry and artillery regimental commanders; the latter were in direct communication with their battalions; if direct communication was cut off to some point it was possible to telephone through other units. Communications worked successfully even when the troops moved into the forest. This played a big part in the final outcome.

Although all did not go smoothly, the battle developed according to plan. The artillery broke up the forward positions of the enemy defense, especially near Romanovo and Kamenskoye. As soon as the main effort jumped off, the artillery delivered support on the narrow front. The enemy mortar fire from the rear was effective in open areas, and to avoid losses the infantry increased its speed of movement.

The main attacking force broke through the edge of the forest, overcame the resistance it met, and penetrated the rear to silence the enemy artillery.

The enemy attempted several counterattacks without success. Automatic riflemen tried to break up our combat formations in the forest, and we sent out small combat patrols to overcome them. These patrols greatly assisted the rather wide maneuvering in the enemy rear—up to four and a half miles. Tactics throughout the division were to pin down an enemy unit from the front and have a maneuvering force attack from the rear. The enemy tried to take up positions at Aristovo and Alopovo, but units of our division were able to out-maneuver them. The Germans withdrew.

The Germans used attack aviation and antiaircraft artillery against our infantry troops, but once the penetration was made they could not stop the attack.

Protection Against Air-Borne Troops

With Particular Reference To Vulnerable Points Such As Airdromes

[From *Canadian Army Training Memorandum Number 15* June 1942.]

German Air-Borne Troops

Definition.—All troops carried to the scene of action by air are called air-borne troops and they are sub-divided into

(a) Parachute Troops
(b) Air-landing troops who land in aircraft, either transports or gliders.

Parachute Troops:

These are picked and trained by the G.A.F. They are young and fit, believed to be all volunteers who are willing to risk an early death for the added adventure. They are distinguishable by narrow brimmed helmets and grey-green uniforms. The equipment carried varies with the task but may include: Tommy gun, L.M.G., 2" mortar, with 3" mortar, M. G.'s, 3" mountain guns, AA and AT guns in the battalion.

There are approximately

120 men to a company.
550 men to a battalion.
1,800 men to a regiment (our brigade), three regiments and supporting arms in an air division.

They are carried in JU 52's, 10 men with equipment in each aircraft. They are supposed to leave the aircraft from a height of 200-300 feet which means they take only 10 seconds to reach the ground and they get into action in 2 to 5 minutes. They are trained to leave the aircraft at the rate of one man every second and as it is traveling only 80 m.p.h at the time, the 10 men land within a space of about 360 yards long. Thus by having three lines of following aircraft, a whole company of 120 men can be dropped in an area of 400x200 yards and can be acting together as a unit in about 10 minutes after landing.

Colored parachutes are used to distinguish commanders so the others can see where one is landing and rally there. Different colors are used also for the various types of equipment and ammunition.

The parachutist while descending and until he gets rid of his harness and gets hold of his weapons, is almost defenseless —that is the time to catch him. Actually on his person he carries a knife, grenades and automatic pistol—occasionally a tommy gun strapped on his back.

Air Landing Troops

These are drawn from ordinary divisions and the only special training is that of getting in and out of an aircraft quickly. For air landing the division is about half the normal size, i.e., 7,000 to 8,000 men, and would not have anything like the equipment that ordinarily goes with it. However some light artillery, transport vehicles, motorcycles, armored carriers and possibly light tanks may be anticipated. The use of captured transport is largely contemplated—a point to note.

Either captured air fields or other suitable landing ground such as clear beaches, unobstructed roads or fields is necessary for employing these forces. But the German is not too fussy and will risk any kind of crash landings, once he is committed. It is obvious that the slow moving JU 52's and gliders are extremely vulnerable to both air attack and AA fire.

While it requires 500 to 800 JU 52's to carry a division of 8000 men, depending on whether or not gliders are being towed, it does not follow that the enemy must have 10 times this number to transport 10 divisions. With close air bases such as exist in France in relation to the British Isles, these troop carriers would shuttle back and forth as they did in Crete. If we were considering an invasion of Britain, therefore, as compared to one of Iceland we would have to count on a great deal heavier weight of air-borne attack.

In the battle for Crete the Germans used a modification of air landing troops in the form of glider-borne shock troops. These were G.A.F. personnel like the parachute troops.

Nature of Employment of Air-Borne Troops

Objectives:

These are pretty obvious depending on the type of operation.

For the nuisance raid, they would be

Wireless stations.
Power plants.
Sabotage and 5th column activities.

For the invasion, on the other hand, objectives of the following type would be selected

Air fields, with complementary tasks for

Communications.
Approaches.
Local military HQ's, all probably based on a strategical plan to secure a bridge head, including a port suitable for landing seaborne forces.

Scale of Attack

Obviously this is going to depend on the enemy's estimate of the power of the defense and ultimately on the factor of time and space as already pointed out. In this respect, however, one is unlikely to make an over-estimate. The German believes in concentration of effort. At Crete the tremendous losses in the early stages did not deter him and as soon as he has succeeded at one point—possibly caught off its guard—he will exploit the landing facilities there to their maximum capacity.

Tactics

It is dangerous to work to any preconception of tactics to be employed by an enemy. Prior to Crete the sequence of attack had generally been

(a) Heavy aerial bombardment (mostly dive bombers).
(b) Parachutists landing and gaining some degree of control of the air field.
(c) Landing of troops in JU 52's and towed gliders. These quickly attacked posts and gun positions that were holding out and gradually gained control of approaches to the airdrome.
(d) Equipment and supporting arms were landed and columns rapidly struck out to complete the strategical plan.

At Crete however, whether according to plans or due to the stubborn defense, attacks of parachutists and glider-borne shock troops were made simultaneously with the dive bombers neutralizing the airdrome defense *during* the landings. It was found that the preliminary bombing attacks had really been close reconnaissance to pin point the AA and other ground defenses. These were then systematically neutralized when the real attack took place.

There is no justification to presuppose this direct form of attack from the air, however. If suitable landing areas exist in the vicinity of an airdrome, the enemy may concentrate there and the attack on the airdrome itself may be entirely a land operation. Again parachutists may land at night and attempt to seize the airdrome by stealth and surprise.

The Defense

Airfields with runways for modern bombers are not easy to hide, but where there are no runways they can be pretty difficult to find if the aircraft are not in evidence on the ground.

The ground defenses definitely can and must be hidden, however. The idea of a Maginot defense surrounding the airdrome is ruled out. Pill boxes, which are almost impossible to hide, also cannot be moved when they have been located. Field works should therefore take the form of slit trenches and open gun emplacements, all carefully camouflaged. Some mushroom type pill boxes are permissible.

The question of the airdrome battle HQ operations rooms, etc., is really a subject in itself, but obviously it should be well off the airdrome proper and in its own defended locality.

The nature of probable form of attack indicates that a fairly mixed force is required to deal with it.

(a) AA artillery—to deal with attacking aircraft and troop carriers.
(b) Infantry—to protect AA artillery from ground attack and for normal ground defense role.
(c) A mobile force—to round up parachutists and attack enemy concentrations. This force would consist of infantry (in MT) with carriers, field artillery, and if possible, tanks; some form of A.F.V. is essential. Counterattack on the airdrome, should it be temporarily lost, would be included as a secondary role.

Object of the Defense

Before dealing with tactical plans it is well to be quite clear as to the object of the defense. This may be stated as

> "To secure the airdrome for use by our own aircraft. To attain this object it is obvious that the enemy must be denied use of the airdrome and that the aircraft on the ground must be protected."

Tactical Plan

A fixed conception of the ideal plan is not sound, but a basic doctrine can be outlined. It must embody

(a) Every locality must be capable of all 'round defense—including upwards.
(b) Flexibility.
(c) Mobility—since it is unlikely that a sufficient force will be available to adequately cover all open spaces in the vicinity.

As for all systems of ground defense it must be built up on a series of defended localities, each not less than a platoon and arranged for all 'round defense. These localities in turn should be linked with the company layout, and the whole wired in. The flexibility is obtained by having alternative positions within the company localities and the troops trained for mobile tasks.

The view is held in some quarters that both AA guns and field artillery should be located within these defended localities, so that siting becomes a problem involving requirements of all arms concerned, and some compromise is inevitable. The AA guns must be sited to cover the airdrome against direct attack and some infantry localities must be sited to

cover it with small arms fire. Ground will invariably dictate, but in all but exceptional cases these localities must be clear of the perimeter of the airdrome and station buildings.

The inclination to *ring* the station with defended posts must be avoided as this invariably leads to difficulties in arranging zones of fire. Again ground will be the controlling factor.

Depth must be obtained and this is found by having "inner localities" and "outer localities." The "inner localities" will be responsible directly for denying the enemy the use of the landing ground and will be primarily sited for command of it. They will not contemplate a mobile role but should rather be in the form of self-contained units capable of holding out for some time if cut off from sources of supply They must therefore be amply stocked with ammunition, food and water, and medical supplies. As long as they are not overrun the enemy cannot use the airdrome. The "outer localities" should be well clear of the station, covering it from "outside" attack. Some field artillery must be able to bring fire to bear on the airdrome, preferably using open sights from their localities, but the primary task of the troops in these localities will be

(a) Locating enemy forces by use of patrols.

(b) Destroying enemy forces before they can concentrate.

As far as possible they should be disposed to cover tactical features of value to the enemy. When mobile tasks are undertaken a skeleton defense force must be left in the defended locality. A reserve in the hand of the Station Commander must not be overlooked. This reserve should be "hidden" until required for local counter attack or "dog fighting" among the station buildings.

AA Defense

Whether the AA guns should be located within defended localities or only between the inner and outer localities is a debatable point, but whichever tactical plan is adopted, there must be at least two alternative positions for each gun. They must not be too close and guns must move quickly during any lull in the attack (lesson from Crete).

Defensive Wire

The ordinary principles for field defenses apply: namely, avoid "standard" construction; use ingenuity; hide wire in hedges, etc.; use trip wires.

Intercommunication

Cable telephone system is the most satisfactory, with loud speakers, but it is not likely to last under enemy attack. Intercommunication by R/T must be perfected and the possibility of using visual signals not discarded.

Antitank Defense

This must not be overlooked. Bofors crews and field artillery are trained in this role. Infantry must be trained in tank-hunting.

Camouflage and Concealment

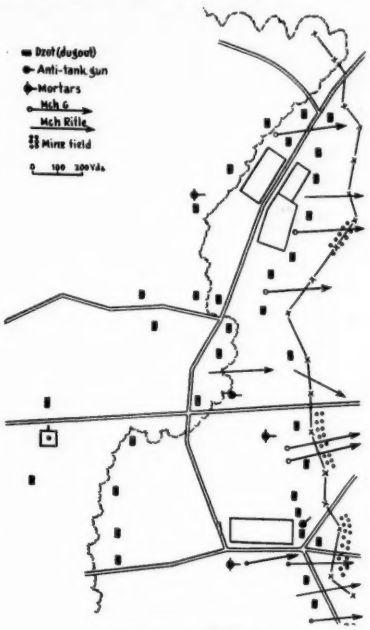
To be of any real value this feature of the defense must be really thorough both in respect to air and ground observation. This is one element that can be definitely tested as to effect. It requires constant maintenance, and expert advice should be sought. Camouflage and concealment does not stop at nets, paint, use of foliage. Other vital aspects are track discipline and dummy field works including not too obvious wire to mislead the enemy.

German Defensive Reinforcements

[Translated in the War Department, Washington, D.C., from the Red Army newspaper *Krasnaya Zvezda* 25 March 1942.]

On many sectors of the front the Germans usually occupied small villages which they used as the basis of their defensive plan. The area outside the village was not occupied by troops except where positions were previously pre-manned by automatic riflemen and machine gunners.

In using villages for defensive positions, such villages usually straddled the road; and the Germans counted on the difficulty in moving off the roads in winter. Our troops, however, used the intervening spaces and operated against the open flanks, and supported by artillery and aviation they were successful.



SKETCH No. 1

In all around defense, such as we met in one sector of the western front where the Germans occupied the forest "Dolgi," (see Sketch No. 1), not only were the villages defended but also the intervening areas. In such places a whole net of dugouts, machine-gun nests and pill boxes was developed. Firing positions were echeloned in depth. Mortar batteries were placed along the whole front. Roads leading up to positions were covered by antitank guns. Some weapons were placed outside the village toward the front.

The Germans paid great attention to defense of forests (see Sketch No. 2). This sketch, planned and drawn by the Germans, was found among captured papers. Upon comparing the plan with actual preparations it was found to be almost fully executed. The only difference was that there were fewer dugouts than shown and the wire obstacles had not yet been completed, probably due to lack of time.

The wooded area was a net of ground works. Some were machine-gun nests and others "dzoti" or dugouts. Along the edge of the forest they dug trenches in the snow in which they had machine-guns; they also dug connecting trenches to all dugouts.

The depths of the dugout averaged six and a half feet and were of different sizes from 6x9 to 12x16 feet; the walls were lined with boards or timbers. For a roof there were 2 to 4 thicknesses of beams covered by 16 to 24 inches of dirt; it appeared as a small mound of earth about three feet high. In every dugout were wooden bunks and a stove. If the dugout was used as a gun position, the gun mount was placed on a wooden table; firing was done thrugh one or two apertures. The Germans frequently placed such gun positions on elevations and in open terrain.

The Germans made extensive use of communication trenches dug in the snow. These snow trenches were also used for firing points in forward positions. Sometimes snow banks were piled up in front of the dugouts as obstacles on the roads.

For the remaining structures used by the Germans, the "fire points" deserve special attention. These "fire points" are used for 360° field of fire and are octagonal in shape. They are lined with timber, and personnel may fire from either standing or kneeling positions. Firing is done through apertures in the wall. In the center of this structure is a protective dugout for personnel not on duty.

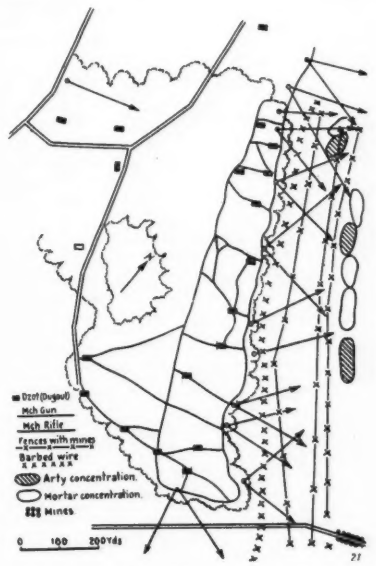
The depth of such German positions extends two or two and a half miles to the rear.

Where there is no opportunity to go around such positions our troops rush them. The success of an assault depends first of all on careful study of the defensive system, the type of defensive works and the disposition of fire power.

A careful reconnaissance will disclose vulnerable spots. In attacking a wooded area, such as shown in the sketch, artillery must deliver a heavy preparatory concentration.

Special care must be taken to insure complete coordination between infantry, artillery and tanks of attacking troops.

It has sometimes been found useful to have some infantry ride on the tanks. These men can seize the first objectives and greatly assist units following the tanks.



SKETCH No. 2

Planning An Attack Against a Village

[An article originally appearing in the Russian newspaper *Krasnaya Zvezda.* Reprinted from an English translation appearing in *Canadian Army Training Memorandum Number 15* June 1942.]

NOTE: Villages in the vicinity of the southwestern front in Russia are generally quite large with populations of from 1,000 to 5,000. They generally sprawl over a wide area in a river valley or around ponds. Cottages facing the street stand behind whittle fences and have large kitchen gardens, also fenced, at the back.

Winter conditions have forced the Germans to center their whole defensive system around towns and villages. The enemy have been avoiding fighting in the open. Often, well prepared defensive positions in front of towns or villages or between them are held with much less tenacity than every house and every street. This is easily understood; the men prefer to die fighting rather than freezing to death.

The concentration of forces in towns and villages has forced the enemy to leave gaps, or lightly held areas, along the front. This has enabled us to make wide use of the tactics of penetration, infiltration and flanking operations to cut off enemy strong points; but at the same time these tactics have increased our difficulties; it has forced us to reduce every village as if it were a fortress, and street fighting has been particularly bitter and prolonged.

The defending garrison can turn any house into a strong point, and often it is more difficult to find out where these strong points are than it is to reduce them after they have been discovered. It is the surprise nature of enemy fire in the village that has the deadliest effect. If the attacker is not thoroughly acquainted with the layout of the particular town or village, nasty surprises await him at every turn. On the other hand, if one has a thorough knowledge of the place beforehand, it is possible to foresee where the enemy mortars and MG's are likely to be located and escape enfilading fire.

In our battalion we have a fixed rule; before an attack we must obtain a detailed plan of the layout of the village—its streets, squares and buildings. If such a plan is unobtainable we must make it up ourselves by questioning the inhabitants of neighboring villages. With such a sketch one can usually guess the enemy's scheme of defense and where his main weapons are likely to be. We then send out scouts with definite objectives for their reconnaissance. The attack is then so organized as to get around the strong points of the enemy and get at them from behind. For instance, a commander knows perfectly well that a large square is likely to be covered by cross fire from several different points and therefore he would avoid such a spot. He would probably advance behind fences, through buildings and back gardens and hit the enemy in the rear.

It would appear that in any town or village one's power of maneuver is limited—but there is no reason why it can not be extended. The street may be straight, but there is no reason to advance along it in a straight line. In sending out scouts we demand that they not only discover the strong points of the enemy but also find covered means of approach. It is unimportant if there are no streets or lanes leading to it, or that they may be blocked. Infantry can still get to its objective by going through walls to effect surprise, and surprise is always the main lever of victory.

Some time ago our battalion was taking the village of Kladezek. On its way to its objective the platoon of Junior Lieutenant Davidov got into a blind alley. Davidov knew about the existence of this blind alley and that behind it was a large yard surrounded by farm buildings which would probably be employed as strong points by the enemy. Another platoon was attacking these buildings from a different direction, but Davidov decided to break through the wall of a barn, which formed this blind alley, in order to emerge on the other side and attack the enemy in the rear. This he did and the sudden blow surprised the Fascists who gave way and ran.

Control of companies and platoons becomes very difficult during street fighting, however. The narrow width of the front enables liaison to be established in depth by the chain method and it is most important that commanders should keep well up with the troops. The scattered nature of the villages in which we have to do our fighting does not hinder this kind of liaison; if a platoon or company moves away from the main axis of attack, we detach more men for liaison work.

In street fighting it is most important to have the closest contact between infantry and supporting artillery. In an open field of battle, gunners can easily distinguish the location of our own men and the enemy, but in street fighting this becomes impossible. There is an old elementary rule that as soon as the infantry reaches a given bound in the course of an attack a Verey signal is fired.

Unfortunately this rule is not always observed, some commanders prefer to keep in touch with the artillery by means of field telephone, others send back mounted dispatch riders which wastes valuable time. This is the method we have adopted: before the attack we agree with the gunners as to the type of Verey signal that will be fired at the end of each bound, and as soon as the bound is reached this signal is fired.

The advance of the artillery keeps pace with the advance of the infantry. A section of regimental artillery is usually employed for close support in an attack. These guns are definitely attached to the companies. They are exclusively over open sites. Sometimes guns are actually emplaced in occupied buildings. In the same village of Kladezek the following things happened: the enemy held a barn behind the village in some strength and covered all approaches to it by heavy mortar fire; repeated attempts by our infantrymen to get to this barn failed; they then dragged one of our 76-mm infantry guns into a hut on the out-skirts of the village and the third shell silenced the mortars—the strong point was destroyed.

The fighting inside towns and villages is mostly close fighting, and hand grenades, bottles of incendiary mixture and shooting at close range have the widest use. We are constantly teaching our men these methods in lulls between fighting. Each new battle for a village brings up some new point or experience which must be passed on to the troops.

Once when we were attacking a village a group of the enemy began to retreat. Two of our men noticed this and decided to get around them and ambush them. After the first few shots knocked out some of the Fascists the rest scattered among the buildings and began to fire from them. We were forced to besiege each building, and hence we came to the following conclusion: that ambushes are very useful but should be arranged at some distance behind the village so that the enemy could not use the cover of buildings. It is much easier to destroy the enemy in the open, and it is not difficult to set ambushes when flanks of the enemy are wide open, and therefore now we always send out an ambush party at the beginning of an attack on a village.

It is never safe to assume that the village is free of the enemy unless every building is checked. Once we occupied a village and advanced beyond it, some sappers arrived to destroy mines and booby-traps set by the enemy when suddenly they were met by machine-gun fire coming from one of the huts. This was a German who managed to conceal himself from us. Now we make the most careful check of every building. If we occupy and remain in a village we immediately send out patrols to check the inhabitants of every house. If the battalion has to move on immediately, this check is carried out by detachments detailed for the recovery of captured weapons and equipment. A particularly careful check must be made of all the cellars, lofts and barns which might harbor the enemy.

Overcoming Mine Obstacles

[An article translated at the Command and General Staff School, Fort Leavenworth, Kansas, from the Russian newspaper *Krasnaya Zvezda* 11 June 1942.]

Combat experience shows that success of action against mine obstacles depends above all on skillful organization of engineer reconnaissance. Thorough engineer reconnaissance has always been fruitful; it has been helpful in the speedy neutralization of enemy mines and in clearing the way for the advancing infantry.

The Germans employ the most varied forms of mine obstacles. It is true that no large mine fields have been encountered on our sector of the front. The Germans usually mine small areas which not infrequently are closely adjacent. These mine obstacles are of anti-infantry, antitank and combined types.

Lately, cases have been observed where detonation of one mine caused immediate detonation of mines placed alongside the first. To accomplish this the Germans place a long, narrow board on top of several mines, or they attach cables to one mine from several sides and connect

them with fuses of adjacent mines. Thus, should a tank hit such a mine it would not be the only object to suffer damage. The detonation of other mines may do damage to other tanks or to troops riding atop them.

German mine fields are not great in depth; they usually consist of 3 or 4 rows, in isolated cases 5 or 6 rows. Until recently the Germans were placing mines in a strict checkerboard design which made it easy to locate them. At present the Germans do not maintain precise intervals between mines. On the fields which were recently cleared by us the intervals between mines were anywhere from 1.5 to 7 feet.

The so-called "inextractable" German mines are encountered with increased frequency. In order to prevent our sappers from lifting the mine, the Germans attach a special fuse at the bottom of the mine to which a cord is tied. As the sapper, who supposedly has rendered the mine harmless lifts the mine, the pin to which the cord is fastened is released and the bottom fuse detonates the mine in the sapper's hands. In order to deceive our sappers the Germans sometimes mix such mines in among those of the common type. Therefore, before lifting the mine the sapper should walk about 165 to 200 feet away and pull the cord attached to the mine. Thus a check can be made on whether there is another fuse at the bottom of the mine.

In speaking about anti-infantry mines employed by the Germans, mention must be made of their "springing mines." The principle of their action is based on a charge which causes the mine to jump upwards, whereupon the mine explodes at about a man's height, scattering shrapnel to a distance of about 33 feet on all sides. However, our sappers have soon found weak points in these jumping mines and have invented the means for combatting them. A mine of this type has dead space. When a man falls to the ground the splinters will fly over him. When on the move the roads must be carefully watched, and sappers should be called as soon as a mine is found.

For anti-infantry action the Germans also employ various tricky land mines. They consist of standard, metal covered charges. There are two or three openings for fuses. The charges are square, also round (resembling food cans). Mines of this type are usually placed in houses, bath-houses, barns, under gates, near fences, on trees, etc. When the work of sappers is careful these mines are speedily rendered harmless.

The main thing for the sapper is to locate the mined area. To accomplish this, German methods and habits should be known. In wooded terrain the Germans as a rule mine the outskirts of the forest, lanes cut through the forest, glades, paths, roads and intervals between swamps. In working on the outskirts of a forest and on approaches to populated points we have frequently encountered signalling mines which were dug into the ground or suspended from trees. Cord or a thin wire attached to the pin was carefully camouflagued in the grass. As soon as one of our scouts inadvertently touched the cord or wire, a heavy explosion took place, which served as a signal for the Germans who then opened fire. When engaged in reconnaissance our sappers make efforts to find such signalling mines and render them harmless, and of late there was not a single case where such mines revealed the movement of our scouting party.

The sapper should not only be brave and possess special knowledge but he should also have a keen sense of preception. A mine locator and a probe are not alone to be depended on. One must be able to develop his eye in order to find characteristic symptoms which lead to location of mine fields. In this respect the sapper group command by Lieutenant Seriy is well trained. Mines which are placed in glades and dells are located by his men among clusters of flaccid or yellowed grass. Mined trees are revealed by cut and broken branches: i.e., by those signs which the Germans leave in order to themselves recognize danger areas. In populated points sappers seek mines wherever there are protruding rope and wire and fence markings.

It is most difficult to notice a mined road or path from a distance. However, even here the sappers trained eye notices indications of mines such as fresh mounds, traces of work and thin wires or cord running from underground. These symptoms should be well known not to sappers alone but to infantry scouts as well. When it is believed there are mines in the area, sappers proceed carefully to examine the ground with the aid of mine locators and probes.

The sapper should be able to work with skill in any position, particularly when lying on the ground in which position he must most frequently work on the battlefield under enemy fire. As the passage for tanks and infantry is cleared, the sapper commander contacts commanders of units engaged in the advance and gives them precise directions on the route they are to follow. Following this the sappers immediately begin reconnaissance of the next enemy defensive line in the direction of advance.

When we encounter a mine field we strive to render it harmless unbeknown to the enemy. We detonate the mines while artillery is firing. Frequently this produces great effect. One of our units had the mission of advancing against the enemy flank and delivering an unexpected blow. The group of sappers commanded by Lieutenant Tyukov took advantage of the artillery cannonade and unbeknown to the enemy de-mined several mine fields at the junction of two German battalions. The Germans did not expect our attack from this direction which was so thoroughly protected by antitank and anti-infantry mines. Our unit crossed the de-mined area and suddenly appeared within the enemy position. The mission was successfully executed.

We employ a simple method for demining roads, paths and forest lanes. We have rollers made from thick trees. The roller has an axle to each end of which ropes are tied. Men pull the roller which by its weight presses the fuses of the mines placed on the road and causes them to explode.

Frequently, sappers of our battalion must act jointly with tanks during combat, clearing the way for the latter through mine fields. When preparing for a tank attack we send a large group of the most experienced sappers with general and tank reconnaissance. During reconnaissance these sappers render enemy mines harmless and clear passages. The sapper groups which follow them continue this work. If the advance must be developed with speed, sappers are included in parties riding atop tanks. They help tank crews keep the proper course and drive through the cleared passages. As tanks leave the mined area behind them, the sappers alight from the vehicles and begin to clear the entire area of mines.

Defeat of a German Center of Resistance

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article in *Krasnaya Zvezda* 7 June 1942.]

Among the May battles which took place on the northwestern front, there should be singled out a one-day engagement involving a certain unit. This engagement is characterized by the precision of its conception, execution and the coordinated action of the various arms.

The mission which was assigned to the unit consisted in capturing three villages situated on a road net in a terrain which afforded secrecy in the concentration of forces. Hills with convenient approaches, prevalent in this sector, were to be helpful in this operation and it is therefore easy to understand that the Germans tried every means in order to retain possession of such favorable positions. The enemy had converted every village into a point of resistance which was fortified over a period of several months. Altogether this was a powerful center of resistance with a great number of dugouts and mine fields strongly protected by automatic weapons, mortars and artillery including antitank guns. As much as an enemy regiment was engaged in defending this center of resistance.

Our forces succeeded in liquidating enemy units situated on the hills which were directly covering the center of resistance. All these hills, and especially one of them, dominate the terrain. For them the German positions forming the center of resistance were visible in depth. In this manner chances for the organization of combat for the capture of these populated points were enhanced.

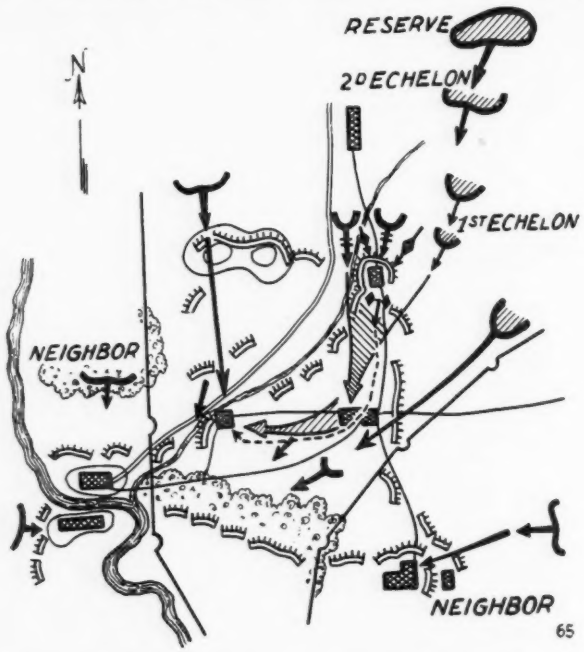
The attack began after a thorough reconnaissance executed by the unit commander from several points on the terrain and after a many-sided preparation for the battle, for which there was sufficient time.

At 5:30 artillery opened fire simultaneously against the full depth of the defense. This fire was from both open and concealed positions. Enemy dugouts and firing positions in three centers of resistance were placed under intensive fire. Guns of great power were firing at the German artillery positions far in the rear of the villages.

It is necessary to note one detail which shows how well the artillery preparation was conceived. During the night, gun crews erected platforms for fire from open positions. At the appointed hour, the artillerymen rolled out their guns from the concealments and opened fire. In this particular unit we have observed the following picture. The Germans opened strong fire from their heavy mortars against our guns which were firing with open sights. Finding themselves within the zone of frequent explosions of enemy shells, our gun crews rolled their

guns back into the concealments and a little later rolled them back again onto the platforms, continuing to fire with open sights. In this manner it was possible to avoid unnecessary casualties and at the same time fire accurately.

All preparations for the battle were executed with secrecy. Therefore the massed artillery fire which so suddenly broke down on the enemy apparently stunned the Germans. It is characteristic that the Germans did not open fire from their distant artillery positions until after forty minutes had elapsed.



The strongest artillery fire was concentrated on those objects which were to be immediately attacked by our infantry and tanks. According to the commander's plan, the main effort was directed against the point of resistance in the first village situated due south of the attacking forces (see sketch). Not until after destruction of the enemy battalion defending this point would it be possible to depend on a successful development of the engagment. With its accomplishment, however, a breach was to be formed which was to disturb the system of fire of the entire center of resistance. Conversely, blows against German positions in the two next villages did not augur the successful solution of the general problem if resistance continued in the first village. It is for this reason that at the beginning our artillery directed the great mass of its fire on this particular center of resistance.

At a signal, an attack against positions in the first village began at 7:00. At the same time auxiliary forces began action against other points of resistance. The latter actions were, for the time being, in the nature of demonstrations in order to commit enemy forces.

The attack was coordinated. Tanks went forward from their starting positions closely followed by infantry. Here again certain details should be noted. Excellent reconnaissance of terrain and enemy obstacles enabled the correct marking of the route of tanks during the battle. Passages were cleared by the sappers through mine fields. These passages, as well as the entire route, were indicated by markers. Thus every tank crew drove its vehicles with assurance, without fear of hitting mines or a bog with which the terrain abounded. During the period of preparation all tank personnel became familiar with the groups of infantry which, during the attack, were to be protected by the tank's armor. All tanks were numbered and the numbers were inscribed with chalk on the tanks and stood out prominently. Each group of infantrymen knew its tank, and everyone carefully watched the vehicle. Commanders of tanks and of infantry groups established signals and were carefully watching each other. Therefore infantry and tanks acted in concert and infantrymen did not break away from their vehicles.

Cooperation with regard to time and stages of advance was so organized that there were no serious delays during the course of the engagemnts. After reaching a pre-determined line the artillery fired a series of rockets to signal the moment for transfer of artillery fire, and the attack followed immediately. Tanks and infantry broke into the village. Within three hours the remaining enemy firing positions were liquidated. At 10:00 the important point of resistance fell.

It is significant that our tanks did not suffer losses. A portion of enemy antitank weapons were silenced even prior to the attack, while the remaining ones were being silenced by the accurate fire of tank guns from tanks which were proceeding with the infantry. Of thirty-four enemy antitank guns only a few survived.

The artillery cooperated by successive concentrations of fire on objects which, at the time, were under the immediate attack of tanks and infantry. Thus, during the second stage of the battle, our artillery directed the main mass of its fire against the point of resistance situated in the village to the south of the first. As soon as our assault group reached this point closely following the retreating and disorganized enemy units, a new series of rockets were fired and the artillery immediately transferred its fire. Our assault and holding groups, engaged in this sector, attacked simultaneously. At 16:00 the second point of resistance fell.

In the meantime our second holding group engaged the enemy at the approaches to the third village and our artillery opened fire against these German positions. Enemy resistance at this point was particularly violent. The Germans made use of the stream which flowed in front of their front line of resistance. In this final stage of the engagement our aviation was brought in to aid the infantry. Immediately following the air bombardment our assault group attacked the German positions from the east, while the holding group attacked from the west. At 18:00 the engagement ended with complete defeat of the entire center of resistance.

Of interest in this engagement is the maneuver of the assault group which was successfully coordinated with the action of auxiliary groups. As is seen from the sketch, the assault group was attacking directly south. After capturing two villages in succession it turned west, all the time keeping in readiness means and forces for repelling any possible counterattacks against its flanks. Its attacks were coordinated with attacks of connecting groups on the flanks. During this action there was no confusion such as is sometimes observed when forces are weakly led and when cooperation is poorly organized.

The Life of Artillery Pieces

[An article in *Ejercito* (Spain) June 1942, which was reprinted from the German *Wehrtechnische Monatshefte*. Translated from the Spanish at the Command and General Staff School, Fort Leavenworth, Kansas.]

If we desire the longest life possible from any firearm, including artillery pieces, it is necessary that certain rules be observed not only in time of peace but also in time of war. Along with our efforts to improve ballistic properties of firearms we should also make an effort to increase their length of life. There is involved in this effort not only consideration of a tactical nature due to necessary diminution of better activity till a gun can be replaced but also considerations of a technical nature due to the difficulty experienced in obtaining steel in time of war.

The life of a gun varies greatly depending on classes of matériel involved. First of all it is determined by heat of combustion and amount of propulsive charge employed. The larger the caliber of the gun, the more rapidly will it wear out. Powders containing a large proportion of nitroglycerine are particularly harmful. Also, ammunition employing a shell to hold the propulsive charge causes more damage than ammunition with which a separate charge is employed.

Naturally, the better the steel from which a gun tube is made, the longer the tube will last; too, the driving band should not offer too great resistance or the edges of the lands in the barrel rifling will be slowly worn away, something which occurs when driving bands are made of too hard copper or of substitutes such as iron.

The form of the powder chamber and characteristics of the rifling also influ-

ence the length of life of the tube. The powder chamber should be of a size consistent with combustion temperature of the powder employed and should not be joined too abruptly with the rifled portion. Likewise, the pitch of the rifling should not be too great and the edges should not be too sharp, but rather the point of their juncture with the lands should be rounded.

There is considerable difference in length of life between tubes of the same class. These differences are due mainly to variations in constitution of the projectiles, different forms of fire employed, type of service they have been used for as well as the care and attention bestowed on them. If they are subjected to continuous and rapid fire without proper attention to cooling, their lives will be considerably shortened. For this reason the tubes of rapid-fire guns are regularly short-lived. Good placement of the projectile when the gun is fired will lengthen the life of the tube. In addition, effort should be made to keep the inside of the tube perfectly clean and evenly greased and polished, keeping it perfectly smooth. Otherwise rough spots will serve as a point of attack for powder gasses, destroying the bore.

In the case of the German 77-mm field guns, average duration of the tube during the last World War varied between 15,000 and 20,000 rounds. In the case of the French 75-mm gun, this length of life is at the present time between 6,000 and 23,000 rounds. (During the World War the tubes of the French field guns became useless after 8,500 rounds.)

Generally speaking, in works treating of the subject one has to be contented with a statement of the characteristics of various tubes in terms of the average number of rounds of which they are capable before becoming useless. Accordingly, we find that Culmann in his *Tactique d'Artillerie* (Paris, 1937) gives the following figures for the length of life of the tubes of the French artillery:

Weapon	*Number of Rounds*
75-mm cannon	12,000
155-mm howitzer	7,000
155-mm long-range cannon (Grande puissance Filloux)	3,500
305-mm naval cannon	1,200

The tubes of English cannon, according to the *Nazione Militare* of December 1939, have only the following length of life:

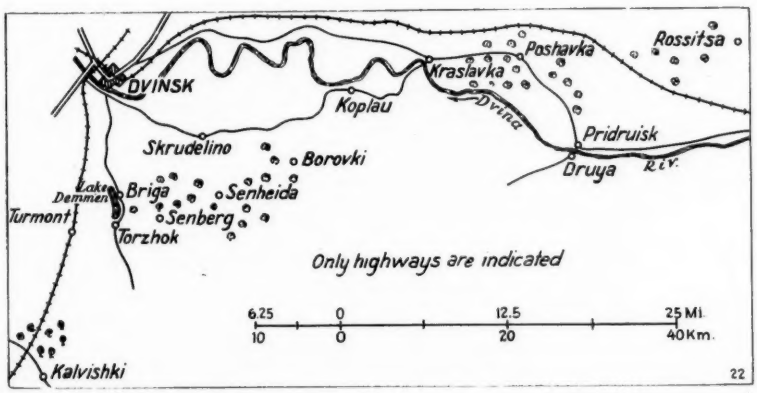
Caliber	*Number of Rounds*
75-mm	4,000
100-mm	740
127-mm	640
152-mm	400
203-mm	250
234-mm	200
254-mm	160
305-mm	150
353-mm	100
406-mm	about 80

A comparison of the figures given for French and English tubes shows clearly the inferiority of the latter. Apparently, it seems that in making up the figures for the English tubes the lowest possible figure for the life of the tubes was taken. This idea is fully confirmed if it is considered that according to English figures, the English 406-mm cannon lasts but 80 rounds while the same caliber tube in the American navy, the L/50 M 11 1919, according to the *Elements of Ordnance* has a length of life of 180 rounds.

From the facts just pointed out, it can be deduced that the length of life of a gun is influenced not only by its technical qualities but also by circumstances affecting its handling and employment.

Forward on Roads Off the Main Route of the Army

[An article translated at the Command and General Staff School, Fort Leavenworth, Kansas from the German in *Artilleristische Rundschau* April 1942.]



It has repeatedly been the experience of our horse-drawn, heavy field-howitzer battalion, that what apparently were the best firing positions and observation posts were of but little use if bad roads made it impossible to reach them in time.

The heavy battalion, which is located farther to the rear than some other units, was obliged to travel continually with its heavy loads over roads which had already been deeply cut by hundreds of vehicles; yet it was supposed to reach its assigned position promptly and open fire at the same time as the other weapons. Attempts to solve this difficulty in the usual manner resulted in long delays, stopping the column and getting helplessly stuck on the roads.

It is not strange, therefore, that an effort was made to seek other routes off the main lines of travel. Our scouts distinguished themselves in this work. Under conditions obtaining in the Russian theater of war, these scouts did more important work, at times, than the "artillery scouting detachments." For although such roads were to be found everywhere according to the map, it required investigation to determine whether or not they were passable for our unit. In this manner therefore, with the scouts—lieutenants on horse back accompanied by dispatch riders—in the lead, our march to and through Dvinsk was accomplished early in July 1941 through terrain which was entirely unfamiliar, inhospitable and trackless.

Where the highway from Kalvinski crosses the railroad 20 miles south of Dvinsk and runs on to the northwest stood the first of the road markers erected by our scouts. There it stood on the east side of the tracks indicating direction to the northeast. These road markers proved to be of considerable value, especially on new roads. They saved a great deal of exertion on the part of the horses and distinctly marked out the roads. It was unnecessary to have dispatch riders follow us, and mistakes were thus avoided. Yet it required a great deal of thought on the part of scouts to place these markers properly. They had to apply accurately to the unit for which they were intended and take into consideration that the troops occasionally might have to find them at a very different time of day or even under very different weather conditions.

While waiting at the above mentioned railway crossing for the following battalion, we saw that a few men, in spite of strict orders to the contrary, were letting their field canteens down into the deep well at the crossing. They claimed that the water tasted fine and that it was cold. When they arrived the Latvian guards at the crossing said, however, that this well along with others had been polluted by the Russians. We got into conversation with them about condition of the road we intended to follow. They advised strongly against it. As a matter of fact, the road did not impress us favorably at first, and after running for a short distance into the woods appeared to be nothing but deep sand. But we were able to detour around the bad place in the woods, and we found it to be satisfactory—again a proof that one should not trust the statements of natives. As a matter of fact, we were able to get over the road quite easily with our heaviest loads—much more easily than we could have over the heavily travelled main route of the army. Going along on the east side of the railway, we came to Turmont, and, farther to the northeast, Torzhok on Lake Demmen.

A day later, in order to avoid terrific heat, we did not set out until late afternoon. The road now led eastward through fields of waving grain and many miles of lonely forest. Here we met neither friend nor enemy, and there was no sign of war. Off to the side of the highway lay Briga, Senberg, and Senheida.

The headquarters proceeding ahead of the battalion in the bright moonlight night ran onto some members of the volunteer Latvian reservists of the old classes on the market square of Borovki. They assisted us and rode in the tank for a time. The battalion reached Skrudelino at dawn.

The next day we were forced to follow the common highway as we went along the Dvina in the direction of Koplau. Since there were a few deep ravines which could be crossed only over this

highway, we could not follow off to the side over minor rural roads.

Early the next morning we again abandoned the highway and proceeded across fields and woods. At times the roads were so narrow that there was just room for the broad-gauged carriages of the heavy howitzers; yet they all were solid. During the course of the day our artillery engineers rendered good services. Going ahead on bicycles and armed with picks and shovels, they removed all obstructions. In some places they had deep holes to fill; in others, marshy places to bridge. They quickly cut down trees as thick as one's arm, cut them to the right length and put them in place, forming a regulation corduroy road across the marshy stretch. Wholly wrecked bridges across ravines with streams in them no longer form an obstacle. While part of the men cut trees for girders and transoms, others brought up big rocks and stones for holding the material while a third crew plied its shovels and threw earth on the structure. A bridge built in this manner also held for the entire division following.

We again reached the main highway in this manner at Kraslavka, crossed the Dvina at this point and then followed the highway, crossed in several places by ravines, eastward to Poshavka. Here after several hours rest, we received an order at 9:00 PM to continue our march. This time road reconnaissance had to be carried out in total darkness. The main highways were cut entirely to pieces so we saw that if we were to get ahead at all, we would be forced to follow side roads, even though they might be extremely narrow. Some, we found, were very sandy and at the same time had steep stretches which could not be improved or detoured. In order to exhaust all possibilities, both mounted troops and the battalion headquarters went on a reconnaissance at the same time. The relatively best road was selected by putting together information obtained by both detachments. On the road so chosen, the battalion then pushed ahead through the entire night and next morning. When our infantry started to break through the Stalin line to the east of Rossita in the afternoon, the heavy artillery was also in position after a march of over 30 hours.

That the battalion was able to accomplish all this was due to selection of new routes whenever possible so that the horses had to use their entire strength in only a few places and were not driven ahead over roads that were constantly bad. All this time the supply of fodder for the horses was very limited. They were fed mainly on grass and leaves, which had to be gathered during every short halt.

From Rossita on, being in constant contact with the enemy, the battalion at first had to renounce the use of side roads. Up to that point the scouts who picked out the roads and resting places had also fulfilled their other task, that of furnishing close security. There must certainly have been many enemies scattered through these woods where we were now the first to go. But the attentiveness of our mobile scouting detachment constantly protected us against surprise.

The Army Convalescent Depot in This War

[An article which appeared in *Journal of the Royal Army Medical Corps* April 1942.]

In his book, *Organization, Strategy and Tactics of the Army Medical Services in War*, Lieutenant-Colonel T. B. Nicholls says: "Convalescent Depots are intended for the reception of officers and men who require no further active treatment and who, though not yet fit for duty, are likely to become so within a reasonable period. The organization, therefore, is directed with a two-fold aim; to hasten convalescence and harden by graduated exercises under medical supervision and to retain its occupants. It also relieves the strain in General Hospitals in time of emergency."

Considerable experience was gained during the last war in the organization and running of such Depots. The establishment then was for 2,000 patients per Depot, though there were one or two with greater capacity, up to 5,000 patients.

In summer the patients can be accommodated in tents and marquees but huts ments or existing buildings have to be used in winter.

The men go through a graded training so that they will be fit for duty on discharge. If the patient relapses he is returned to hospital; if it is found that a patient cannot be made fit to return to full duty he may be brought before a Medical Board to decide whether he shall be discharged from the Army or his medical category lowered to insure that he shall be employed only on duties for which he is capable. By this means, during the last war, large numbers were quickly returned to Army duties, sometimes without returning to England at all.

The Staff laid down to run a Depot consists of a small nucleus of officers and men of the R.A.M.C., one of which commands the Unit, and about four officers and fifty other ranks *from Infantry Units*. These members from the Infantry are "attached troops," as a Depot is definitely a Medical Unit.

The medical work entailed is as follows: (a) The medical examination of men on admission and discharge. (b) The medical classification of men on admission, and the weekly re-classification of such men. This may entail the reclassification of sixty or seventy men every day when the Depot is full. (c) The minor treatment of wounds. (d) The medical treatment of emergency illness in a special detention ward of six to ten beds, (e) The supervision of remedial treatment and cases of massage and the use of special remedial apparatus as devised by Dr. Mennel. (f) The supervision of Physical Training Classes.

Other duties which fall upon the Staff are: (a) The administration of the unit as a whole. (b) The holding of daily parades. (c) The allocation and supervision of fatigues. (d) The education or mental exercise of patients, for which a Warrant Officer and sergeant of the Army Education Corps are attached. (e) The organization of games out of doors and in the Depot. (f) The supply of entertainment for the patients.

The Medical Officers have to bear in mind that the Depot is primarily established to get men back to the fighting line or war training as soon as possible.

In this country a Depot has been established in each Command to hold 1,000 patients. The short campaign on the continent did not give time for the Depots established there to function to full capacity, as in the last war, though two or three were started.

A Depot overseas may be supplied with cases from Field Ambulances, Casualty Clearing Stations and Military Hospitals. In England during this war the Depots have received patients from Emergency Medical Service Hospitals as well as from Military Hospitals—and, up to the present, more from the former than the latter.

The cases dealt with have been: (a) Men convalescing from sickness. (b) Men convalescing from operations performed to render them fit for military service. (c) Convalescing casualties from the French and Norwegian campaigns. (d) Quite a considerable number of French, Polish, Czech, Dutch and Belgian soldiers evacuated to this country.

Many of the first two groups—those convalescing from sickness or remedial operations—have had less than two months' service in the Army.

A number of cases of fracture have passed through the Eaton Hall Depot and have emphasized the growing importance of the orthopaedic surgeon.

Men, in some cases after quite a short period in the Army, have been admitted to an E.M.S. Hospital for some sickness or remedial operation. Here they have had the advantage of a completely civilian atmosphere. They have in many cases been frequently visited by relatives and friends and later sent on leave.

These men were not being trained to make them fit for military duty prior to their return to their units. Men are now sent to Army Convalescent Depots after leaving E.M.S. Hospitals and come under military discipline. Leave is dependent on good progress in physical training and good behavior.

The atmosphere in a Convalescent Depot is military with parades and strict military discipline. The wards are similar to barrack bedrooms and biscuits are piled at the foot of the beds with kit every morning with military precision. Patients are not allowed to remain in bedrooms after they have been cleared in the morning.

The life in a Depot is as follows:

The morning after arrival at the Depot the patient appears before the Medical Officer at 9 AM, and at the same time and on the same day in each subsequent week. The man is classified according to his medical condition for certain fatigues and for a stage of physical training. Each man is given an identification card with his name and classification for fatigues and P.T. written thereon. This is renewed weekly.

Fatigues are carried out from 9 to 10:30 AM. The permanent Staff for a Depot is a very small one and the help of patients has therefore to be utilized. If the unit is under canvas the fatigues are not so numerous or arduous. In a hutted camp the huts will usually hold about thirty men in each hut and are easily kept clean. Sanitary fatigues are necessary for both canvas and hutted camps.

Patients are kept busy with such occupations until a break at 10:30 AM, when each is supplied with half a pint of milk.

There is also a dry canteen, run by the N.A.A.F.I., which is open after parades.

The patients parade again at 11:15 AM in their different categories under instructors of the Army Physical Training Corps of which there are five.

The present-day Army Physical Training endeavors to inculcate rhythm, balance and mental alertness as well as to exercise the muscles. It can also help to correct certain postural deformities. The syllabus of training is well devised to attain this object and includes the use of wooden staffs, medicine-balls of various weights and elaborate children's games.

The patients marked down for special remedial exercises and not fit for general physical training, parade under male masseurs of whom there are six. These men give special remedial exercises in small classes and a certain time using special apparatus, devised by Dr. Mennel, which includes wall-bars, the stationary bicycle with adjustable resistance, the rowing-machine and the steersman's wheel. Patients are also given massage and passive movements on the couch.

On two days a week a route-march replaces the Physical Training parade. The lame and those in leg plasters are paraded under a Warrant Officer of the Army Education Corps and given a lecture on map-reading and kindred subjects.

Dinner is at 12:30 PM, when a generous and varied diet is provided including plenty of fresh vegetables.

Organized games under the A.P.T. Instructors take place from 2 to 3:30 PM. These include cricket in summer, football, hockey and baseball.. Those on the early grades of physical training are not allowed to play games.

There are voluntary games from 3:30 at 4:30 PM.

A Warrant Officer and sergeant of the Army Education Corps are attached to the Staff. It is the duty of these men to give talks and lectures to the patients on topical subjects between 5 and 7 PM. They also endeavor to establish classes for mathematics or languages. The rapid change-over of population in a Depot renders a continuity of syllabus impossible and the instructors are limited to isolated talks on different subjects.

These members of the A.E.C. also arrange indoor amusements for the patients between 8 and 10 PM, such as whist drives and darts and domino competitions. There are usually two or more billiard tables in a Depot.

Through the E.N.S.A. organizations concerts and cinema shows are also provided.

The proportion of patients suffering from war wounds has so far been small. The following table, which does not include foreign soldiers, refers to cases which have passed through the Eaton Hall Convalescent Depot between January 15, 1940, and September 30, 1940:

Nature of Cases Treated	*No. of Cases*	*Percentage*
LUNGS:		
Bronchitis	130	8.9
Broncho-pneumonia, pneumonia, pluerisy	157	10.7
ABDOMEN:		
Hernias	121	8.2
Appendix	60	4.1
Other abdominal diseases	40	2.7
Rheumatism, sciatica, etc.	77	5.2
Throat diseases	62	4.2
Debility	25	1.7
Injuries, etc., to bones and joints	136	9.3
Fractures	135	9.2
Cardiac conditions	20	1.3
Wounds	132	9.0
Neuroses	48	3.2
Miscellaneous	317	21.6
	1,460	
RESULTS:		
Discharged to unit	1,268	87
Discharged to hospital	191	13
Died	1	

Cases with gastric conditions present considerable difficulty. A Depot is a non-dieted hospital and can only obtain certain variants from the normal diet of a healthy soldier through Allowance Regulations. Provision of a special diet to convalescent cases would be very difficult and would almost certainly lead to discontent among other patients and unjustified demands from them. Eaton Hall Depot has been spared an influx of such cases because hospitals were warned of their unsuitability before the Depot began to admit patients.

Should an expeditionary force function in the future we shall expect to get rather different types of cases through the Depots. There will almost certainly be a higher percentage of men suffering from war wounds causing considerable disability and perhaps a greater number with war neuroses.

It may be suggested that there is room for a section for Early Convalescents in a Depot where patients can have further treatment before they attain a stage of recovery sufficient to submit them to graduated retraining to fit them for return to their units.

Such an arrangement would entail the division of a Depot into two sections.

A. For cases in early stages of convalescence as mentioned above.

B. For more advanced cases to be gradually retrained to fit them to return to their units.

Section A would approximate to the usual conception of a Convalescent Home and Section B would function as the present Convalescent Depot. The Establishment of the Depot would need to be modified to deal with two such sections.

It is open to question whether it would be wise to have a section for more active treatment in close proximity to a Training Section. Patients undergoing treatment might not be anxious to be promoted to the Training Section which would entail harder work and indicate an early return to their units. A specialist in Physical Medicine is now attached to each Command Headquarters to give advice on the early and late retraining of disabled soldiers.

If a soldier be so disabled as to render him unfit for retention in the Army he may yet improve sufficiently to make him valuable to the State. The question of rehabilitation of such men into industry will arise in the future and though this may be of no immediate interest to the Army authorities it is yet a liability of the community as a whole.

Cooperation of Animals in War

[An article in "Der Truppen Dienst" which was reprinted in *Ejercito* (Spain) July 1941. Translated from Spanish at the Command and General Staff School, Fort Leavenworth, Kansas.]

At the present time the only animals collaborating in war are the horse, the dog, the carrier pigeon, and, during the World War, the small but valuable canary. The role played by these animals in war is generally known. The canary fulfilled an important mission in the last war on account of its reactions at the least trace of gas which could not be detected by man on account of the lesser sensitivity of his organs of smell.

But the dog has always been the principal collaborator. Dogs for the army are educated and instructed in special schools. They are not taught circus tricks, but an effort is made to get them to use their natural instincts. Later they are divided into special groups of watchdogs, medical corps and messenger dogs and dogs used for pulling loads. When they enter the school and institute, each dog has to take an examination in which he must show whether or not he will be useful later as an army dog. He is given this test when he is six months old. The following is required of him: to follow his owner at different times of day or night across different terrain, to behave properly in climbing stairs, in going into a darkened room, in crossing ditches and streams, on hearing gun-fire, etc. From his examination with respect to these matters, his value to the army is determined.

Timid dogs should be eliminated immediately. The race to which he belongs is immaterial in admitting him to the institute. Only a few physical characteristics are taken into account. For example, the dog must not measure more than 27 inches from his breast to the ground. They are well cared for in these training centers. They are given two good meals a day, at 11:00 A.M. and at 4:00 P.M. If their deportment is bad, they are not beaten, but shut up for an hour or two in a dark room, when they have committed some offense. If necessary to punish them severely, a broad leather belt is placed around them, and they are stood in a corner on their hind feet for twenty minutes. A dog punished this way suffers intensely in a mental way on account of the shame which he endures in front of his companions.

The instruction lasts, on an average, eight weeks, and the greater part of the time is given to developing his sense of smell. The dog uses twelve categories of his sense of smell, the most important of which is that relating to the human being. He must be able to distinguish between the odors of various persons so as to be able to follow a given trail. He must also be able to pick up his trail again after having smelled tar and must be able to tell by smell whether a man traveled by road or across grassy areas, and in the latter case whether the man was on foot or mounted. The dog also learns other signs so as to be able to follow a given person.

Watch dogs are trained in another manner. An uneducated dog will attack anyone; a trained watch dog, only a person who runs. If his master is talking with any one on foot, he follows every movement of the latter with great attentiveness; but if his master shakes hands with the stranger, his interest in that person ceases immediately, since he does

not consider dangerous the person with whom his master shakes hands. Thus dogs are used in important factories as assistants to the watchmen.

The dogs of the Medical Corps have special instruction. If a dog is sent to look for a wounded man, his master puts a "holder" on him, which consists of a short strap hanging loosely from the collar. If the dog runs across a man who is lying down (persons who are standing or walking do not interest him), he seizes the holder in his teeth and runs to his master. The latter takes hold of his chain and follows him to where the wounded man is. During the late World War thousands of men owed their lives to these dogs of the Medical Corps.

The most intelligent dogs are reserved for the role of messenger dogs. The most famous of them is Caesar, who ran ten and one one half miles in 32 minutes. The dogs go over their course by memory or else find their way by smell, passing through a number of places previously impregnated with a special liquid and located a certain distance apart. Caesar is so intelligent that he often takes a shorter path of his own accord.

The mission of messenger dogs is extremely important and the English have related with pride how the worst enemy that they shot when they took a certain sector of the Maginot line was a messenger dog.

Besides the missions mentioned, dogs are also used to pull loads. Two of these animals can pull 500 pounds for a distance of 15 miles and up to 325 pounds for a distance of 10 miles over bad roads. The work of these dogs in the mountains is of special interest as they carry ammunition and perform various other labors. Summing up the work of these animals, we reach the conclusion that in modern warfare the dog is the faithful collaborator of man and is endowed with a great spirit of sacrifice.

Soviet "MO" Motor Speedboats

[An article in the *Information Bulletin* of the Washington Embassy of U.S.S.R., 4 August 1942.]

MO motorboats are known in the Soviet Navy as submarine hunters. That is their direct purpose. But in the present war they have coped with so many tasks that such a name does nothing like justice to their fighting qualities.

MO's are small seaworthy motorboats of 30 to 60 tons armed with automatic antiaircraft rifles, rapid-fire guns and a large supply of depth charges. They are used on all sorts of assignments both independently and in cooperation with other classes of warships, air force and coastal defense. With relatively powerful armament and long range of operation plus speed and great mobility, these small fighting ships are particularly suitable for action along enemy coast and against enemy bases in fjords and on cliffs.

MO motorboats have been widely used in effecting landings. They have proved extremely useful in initial stages of such operations: for instance, in landing men of the Black Sea Fleet at Fedosia.

Assisting Commando Operations

A group of MO motorboats with shock detachments of marines on board dashed into the port. Opening gun and machine-gun fire they headed at full speed towards the moorings on which German guns were mounted, silenced enemy fire and landed the marines. During the further course of the operation, shielded by the moorings from enemy fire, they contributed to the success of the initial landing party and safe arrival and landing of main forces from larger warships and troopships.

It is an axiom of military tactics that when land forces are operating on shore it is the function of naval vessels to outflank enemy land forces and shell them from the sea. Relatively large warships are used as a rule—both gunboats and monitors, craft especially adapted for the purpose, and other ships such as coastguard vessels and destroyers.

The latter type of ships cannot be used in all circumstances. Soviet MO speedboats, however, have shown themselves capable in most cases of giving full support to the flank of land forces ashore. MO speedboats of the Northern Fleet have a particularly rich experience in such operations.

Harassing Enemy Land Forces

During the German's unsuccessful offensive against Murmansk, MO speedboats of the Northern Fleet systematically appeared on the flank of enemy land forces, their rapid fire silencing enemy guns, dispersing infantry and keeping enemy rear communications and shore roads constantly under threat. They were also effective in keeping enemy aircraft away from the district occupied by the flank of the Soviet land troops.

Sometimes the MO's land spotters' task is to signal the position of targets on shore. On other occasions they fire over open sights at short range. These speedboats, skilfully maneuvered, and being such small targets themselves, are remarkably invulnerable to enemy shore batteries. The granite shores and fjords of the Barents Sea provide good shelter and protection for enemy guns. The speedboats come close to shore to spot enemy guns which interfere with the progress of our land troops and destroy them by several well-aimed volleys over open sights. This assistance has been invaluable to the Red Army.

In the summer of 1941 two MO speedboats of the Northern Fleet, returning after shelling certain land targets, took aboard a spotting post and were making for shore. When they were quite close to their destination, they were attacked in waves by 16 enemy dive bombers. However, by skilful maneuvering and well-trained fire from antiaircraft machine guns and automatic rifles, the two speedboats repulsed the attack and shot down two of the 16 bombers.

MO speedboats of the Baltic Fleet have scored considerable successes in anti-submarine operations. In the summer and autumn of 1941 the Germans in the Baltic used submarines as their principal weapon against our fleet and communications. Seven to nine submarines operated simultaneously in the Gulf of Finland alone in the early days of the war. Their operations were literally paralyzed by MO speedboats which not only acted as convoys for ships sailing in groups or singly but also sought and hunted enemy submarines systematically in the most dangerous waters near bases and ports and on the long sea routes.

In six months of war the artillery and depth charges of MO speedboats in the Baltic Fleet destroyed six enemy submarines and damaged seven.

Pioneers Ever Forward

[An article from the *Neue Wiener Tageblatt* 10 April 1942. Translated from German in the War Department, Washington, D.C.]

During the great battles in the east, we often saw pioneers busy at bridge construction and making highways and roads passable, working to overcome swamps, and wherever auxiliary working power was needed. But only in battle did they show the potentialities of their training and weapons. In the front divisions they were experts in taking bridges, they knew exactly where the fuse had to be cut and where explosive charges that had been laid had to be torn out. In combat in communities they cleared rows of houses with hand grenades and concentrated charges. If a river crossing was to be effected, it was pioneers with storm boats and inflated rafts who guided infantry and other troops across the river or often launched military bridges even under enemy fire. Whenever, faced by a powerful developed line of fortification, equipment and weapons of infantry alone were no longer adequate, then the call was heard: "Pioneers forward!" Enemy mines were cleared away. With concentrated charges, lanes were blasted in wire obstacles and tank blocks. The trench system was sprinkled with hand grenades and one bunker after another cracked open with concentrated charges. Pioneers in attack are pathfinders with concentrated charges and flame throwers.

Improvement of the Foremost Line

The war in the east has now assumed other forms. For pioneers, specifically, this means complete transformation from their previous type of combat. In attacks on communities, they still make use of flame throwers. In shock troop operations they break with a powerful surge into enemy emplacements, and demolish combat installations and bunkers with their explosives. The principal mission in defense, however, wherever the front has assumed a rigid form, is to develop the front line and reinforce it with their means. This is tedious work consisting of many small individual details. The infantryman has scarcely located the most favorable defensive position in the terrain when the first work of the pioneers begins. Holes are blasted in the ground, often frozen to a depth greater than 3 feet, machine-gun emplacements are built in them, and communicating trenches are established. At the same time, obstacles are placed in front of positions. First a simple barbed wire fence, then a second one and then more. In front of this, furthermore, a wide area is stretched with trip wires. Gradually, there develops a wire obstacle so broad that it can be overcome by an attacker only with great effort and many casualties. Machine-gun emplacements, previously nothing but im-

proved holes in the ground, are developed into fire-proof dugouts. In the walls, made of many layers of tree trunks, loopholes are skillfully cut, and ceilings are covered with railroad tracks, timbers and sand bags. Only now can the infantryman fire from a combat position in which he is secure against enemy fire.

Mine Fields and Mine Lanes

But the defense line must constantly be made stronger, and more and more routes to the fortifications on the front must be located. While the last steps are still being taken in the development of antitank-gun emplacements and emplacements for the heavy guns, the survey squads of pioneers are already measuring off the mine fields. Laying mines, also a special sphere for pioneers, requires the greatest dependability and the most precise sort of work. From thousands of well camouflaged and concealed mines, it must be immediately possible to locate and pick up each one again. These mine fields and mined obstacles stretch along in front of positions and between infantry points of support. Wherever mines lie, no tank comes through; and attacks by enemy infantry remain immobilized in the mine fields. Only the initiated know the surveyed lanes through the mine fields left open for our own reconnaissance troops and which in case of attack are closed by quickly placed obstacles. For infantrymen it is a comforting feeling to know that there are secret mines against tanks and against guns in front of them.

The tasks of pioneers are not, however, finished with this. More and more possibilities are found. Exits from communities are closed with heavy barricades. Long obstacles of felled trees must be erected. For obtaining a field of fire, entire woods are lopped or cut down. The barriers, tree obstacles and wire entanglements are sown with connected explosive charges so that their removal by the enemy is prevented. One obstacle after another is finished. The front constantly becomes stronger and more invincible, and out of it the firearms at the proper time will speak decisive words. In a short time in this way, pioneers in the east also build a defensive line that withstands the strongest attacks.

Principles of Modern Defense

[An article which appeared in the *Information Bulletin* of the Washington Embassy of the U.S.S.R. 29 August 1942.]

The war has shown that modern offensive methods can pierce immobile defense. Massed tanks, aircraft artillery and automatic weapons concentrated on narrow sectors can break down the main line of resistance and drive wedges into its depth.

The forward drive of tanks that have broken through into the depth of the tactical defense zone and the danger of mechanized pincers closing in behind the defending troops may compel the commander to withdraw to a new line in order to keep his units intact. Hence, from beginning to end, maneuver remains the mainspring of military operations. Positional methods of defense can no longer guarantee success.

Of course, at many stages of the battle, when it is imperative to tie the enemy down and check his advance, well-engineered defenses equipped with modern weapons are of exceptional importance. Skillful, stable defense prepares the ground for routing the shock units of the advancing enemy and gains the time required to prepare a counter blow.

Defenses built in great depth are of great advantage. Artillery and other antitank means, including infantry, staggered deep in the defenses can restrict the enemy's capacity for maneuver and break up his tank wedges. However, these methods do not always achieve the desired results, particularly when operations are in progress on an extended front and the attackers possess high mobility. Moreover, in a war of maneuver it cannot be assumed that the fighting will be restricted to areas which have been prepared for earlier defense.

Wearing Down Shock Force

Here is an example. At the very beginning of the German offensive near Volchansk northeast of Kharkov, a Soviet division resisted numerically superior enemy forces in battle for many hours. When the Germans threw their reserves into action the Soviet command gave the order to withdraw. The division retreated in an organized manner to the next line and managed to complete simple trench work before it met the second heavy blow. For twelve hours this division, acting as a rearguard, repelled the attacks of German infantry and tanks.

After this the units occupied the heights on the second intermediate line, and here fighting occurred which greatly affected the further course of events. For two days stubborn battles raged against German tanks and motorized infantry that had broken through. The enemy lost more than 50 machines and was unable to follow up his offensive.

Those were critical battles for the Germans, who took ten days to regroup their forces, bring up fresh reserves and renew the attack. The division held its ground firmly, and only when danger was imminent did it make an orderly withdrawal from the battle. Clinging to intermediate positions, it wore down the enemy's shock units.

The battles which frustrated the German's first blow at Kupyansk southeast of Kharkov, were fought under more complex circumstances. The enemy planned a pincer movement emerging on the Oskol River. The main direction of the thrust was from Chuguyev on Kupyansk where the Germans had concentrated Kleist's third tank corps sent from the south, about 600 planes and over ten infantry divisions.

The offensive started successfully for the Germans. Breaking through the main line of resistance with a mass of tanks and aircraft, they began to follow up their success in depth. But at the approaches of Kupyansk their tank wedge was suddenly broken by a flank counterblow of Soviet tank groups from the southeast. Timely appearance of the tank reserves decided the first stage of the battle in the Red Army's favor.

Modern defense is based on the idea of counterblows by mobile forces. Naturally this type of defense calls for big reserves. These reserves must be available even at the expense of decreasing the number of troops on the main line of resistance—provided, of course, that the latter are adequately armed with antitank weapons.

Counter Blows at Wedge Flanks

In the early stages of all breakthroughs the advancing army is hemmed in. The important thing is to prevent the enemy from rapidly extending the breakthrough. The advancing enemy must inevitably leave his flanks uncovered. Support points from which the base of an enemy wedge can be cut must be held on both flanks.

The major Soviet operations which led to the defeat of the Germans at Moscow were based on flank counterblows. This was also the case at Yelets where the advancing Germans were compelled to turn back, hurriedly drawing away their troops who were split beyond Verkhovye and Livny.

The nature and direction of the counterblows of defense troops are dictated by the particular situation. In general, the counterblow is based above all on the counterblow is based above all on the principal of interaction between big army formations and in certain cases between the various fronts, using not only tactical but also operative reserves. Sometimes, in their eagerness to stem an offensive, defense troops are inclined to bring in their reserves too early. In such a case the aim does not justify the means. By using up their reserves, the defense troops deprive themselves of the opportunity of taking the initiative at the critical moment.

A massed blow must be met by a massed blow: defending forces must not be dissipated. Pursuit of a mobile enemy wastes time, men and matériel. On the other hand, even a deep breakthrough can be liquidated if one has a strong shock group at his disposal.

Though modern defense is based on maneuver, positional methods of defense are by no means excluded. Firmness in defending a position, plus maneuver, bring the defenders victory.

Defense Against Night Air Raids

[An article which appeared in *Memorial del Ejercito de Chile* July-August 1941. Translated from Spanish at the Command and General Staff School, Fort Leavenworth, Kansas.]

The problem of antiaircraft defense, difficult enough in the day time when visibility is best, is truly complicated when the planes approach by night and the only data available are the sound of their motors.

Therefore, in night combat, the main collaborator must be the sound ranging device with its immediate auxiliary, the searchlight. The antiaircraft artillery will fire blind till the sound detector is able to direct the path of the projector's beams and these illuminate the target.

There is a great variety of sound detectors and projectors, nearly all of them similar, and we shall divide them into two classes only:

1. Mechanical sound detectors which work independently of the searchlight and battery.

2. Electrical sound detectors, electrically synchronized both with the searchlight and the battery.

The first, which are the most antiquated, consist of four sound collectors, or horns, grouped in pairs so as to locate the plane both with respect to direction and elevation through the use of two graduated semicircular scales with which they are provided. Each horn is provided with a conducter at its tip end, leading to an ear-piece which is joined in two different head pieces and go to the crew occupied with direction and range. These crews have control wheels with which they are able to turn the apparatus as a whole. When the sound of a plane is heard in one of the ear-phones, the attendant should continue the search till the sound is heard in both ear-phones, and the apparatus will then have located the plane. With a few simple corrections, the coordinates of the target are then obtained.

The searchlights are from 35 to 60 inches in diameter and possess a candle power of from 30 to 80 million. They are provided with dynamos for supplying their own current. Their reflectors are parabolic and they employ the electric arc as their light source.

Synchronized listening devices differ from the foregoing in the greater perfection of their microphones and the fact that the searchlight is synchronized to follow the movements of the detector and transmit the same data to the apparatus which directs the pointing of the guns of the battery.

Now that we have briefly described these powerful helpers in night bombardment, let us examine their operations.

There are two systems in use:

(a) The sound detectors and searchlight operate separately, transmitting by telephone the approximate locations obtained.

(b) Each battery possesses its separate "synchronized unit" of listening device and searchlight.

The system described under (a) is the most commonly used. In it, the sound and searchlight units work together under a single command, searching the skies with their mechanical eyes and ears. One of the "synchronized units" is usually "the guide" and all the others follow it. All the units must be pointed exactly the same as the guns, making frequent checks of their orientation by reference to the polar star if visible, if not checking by compass.

The system described under (b) is to be preferred on account of greater exactness and rapidity in the transmission of data. Nevertheless, as each battery is equipped with its own sound detecting and searchlight equipment, these will operate on their own initiative reducing the effectiveness of the cohesively working unit which should be formed by the defense system of any city. And this in addition to the fact that there are always some necessary elements lacking in time of war.

Firing begins by direct pointing at the "sound," that is, with the initial data transmitted by the sound detector, and it continues along the trajectory of the guiding searchlight with barrage fire of graduated altitudes and ranges. If the plane is located by the searchlight, the range finder for the battery comes into operation, firing becoming indirect, same as during day time.

The danger in this system lies in the fact that planes usually attack from more than one direction and in waves, series, etc., confusing the signals in the sound detector with resulting confusion for the batteries. If the searchlights succeed in locating one of the planes, all the searchlights are turned on it, this being a moment which is taken advantage of by all the rest of the planes for escaping from this direction and dropping their bombs in comparative security on the objectives of the city which, with the continual fire of the batteries, the explosions of the bombs and the light of the searchlights, will be sufficiently well lighted for a calm and seasoned pilot.

Other powerful enemies of defense are: the moon and low-lying clouds. It is impossible to use searchlights under either one of these conditions for the reason that their rays are not visible when the moon is in more than its first quarter and because the latter cannot be pierced by their rays.

Antiaircraft defense at night comprises another important element, one's own pursuit planes. Their zone of action should be limited and out of the zone of fire of the batteries and should be under the control of the antiaircraft defense command. The pursuit craft are kept constantly informed by radio of the situation relative to the enemy planes and are not permitted to attack except when arriving or departing or at express orders to the contrary.

Pursuit planes have two methods for finding the enemy; the exhaust pipes of the motors which become red hot by the constant stream of heated gases and also by means of a small listening device set to register noises greater than that of their own motor, for instance, multimotored planes or bombers.

MILITARY NOTES AROUND THE WORLD

AUSTRALIA

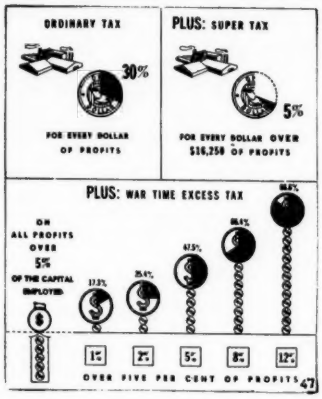
Australian War Finances:

Australian war expenditure was approximately double for 1941-42 as for 1940-41. (This was on the rather formal exchange rate more than a billion dollars.)

War expenditure (in so far as it may be computed on a constantly rising scale) equals half the national income.

Income tax is six times that of the last pre-war financial year.

Australian wartime income tax is high. But it should be noted that income tax represents less than two-fifths of the tax revenue of the Commonwealth.



As a "social State" with a multiplicity of social services, Australia has never been a low tax country. Now it is an extremely high tax country. The income tax although steep does not indicate the amount of tax revenue which the Commonwealth draws—particularly from low income groups.

INCOME	U. S. A.	CANADA	ENGLAND	AUSTRALIA
$500	$500	$500	$500	$500
$1000	$1,000	$1,000	$1,000	$1,000
$2000	$2,000	$2,000	$2,0	$2,000
$5000	$5,000	$5,00	$5,0	$5,00
$10000	$10,0	$10,0	$10,	$10
$20000	$20,0	$20,	$2	$2

48

(Bulletin of the Australian News and Information Bureau September, 1942)

CANADA

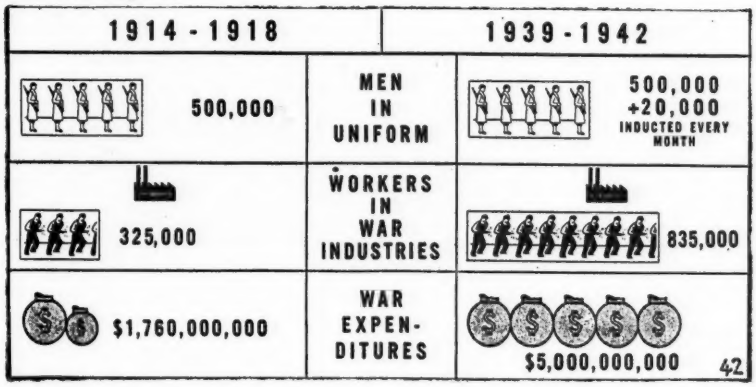
War Production:

Canada's output in the aircraft industry has multiplied 80 times since the beginning of the war, according to Mr. R. P. Bell, Director of Aircraft Production. The industry now occupies five million square feet of floor space and employs 40,000 men and women. There are orders in hand for more than 10,000 airplanes.

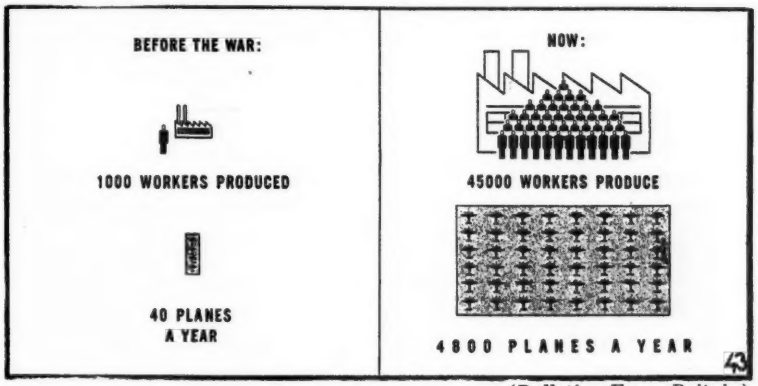
One thousand Curtiss SB2C-1 dive bombers are to be built by the Canadian Car and Foundry Co., Ltd., at its factories at Fort William and Point St. Charles. The first is scheduled to be ready early next year. The motors and instruments will be imported from the U.S.A.

(The Aeroplane)

Canada's War Effort:



Canada's Aircraft Industry:



(Bulletins From Britain)

GERMANY

Air Support For Himmler's S.S.?:

Hitherto, the Luftwaffe has had to meet calls from the German Army and Navy only, but the recent meeting between Göring and Himmler (when the Reichsmarshall presented the head of the S.S. with the highest German flying order, reversing the normal procedure) may foreshadow air support for Hitler's private army. At the moment there appears to be no suggestion that the S.S. shall have its own air force; but an independent air force is almost certainly planned for it. This may be either a "Flieger Division" or a "Flieger Korps," and the unit most favored now seems to be the "Richthofen Nahkampf" (or close support) "Fliegerkorps."

The Commander in Chief of the new S.S. air formation is likely to be Colonel-General von Richthofen, according to "Die Zeitung," the Free German newspaper printed in London.

(The Aeroplane)

New German Gun's Muzzle Brake:

The two pictures of German tanks captured in the Western Desert show the curious bulbous attachment on the muzzle of a new, long-barrelled gun mounted on a Mark IV Special. Known as a muzzle brake, the attachment is designed as an additional absorber of recoil—one of the problems always facing designers of tanks, whose necessarily restricted crew's quarters leave little room for recoil inside the fighting chamber. The new gun illus-

trated has a normal recoil mechanism, but the muzzle brake forms an adjunct to this by employing the discharge gases as a further check.

(The Illustrated London News)

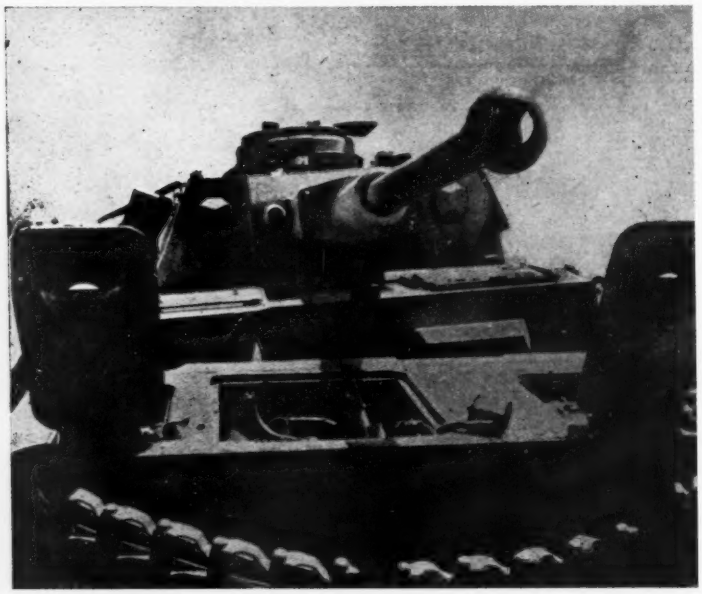
New German Tactics:

Analyzing the operations that took place during the early part of July in what was then called the Kursk offensive, General Yarkin, writing in "Izvestia" points out that various changes in German tank armament tactics were noted. It was seen that the German tanks generally tried to avoid battle with Russian machines, the Germans recognizing the inferiority of their T4 type to the Russian K.V.'s and T34's. It was left to the Luftwaffe to deal with the Russian tanks. The German T4 tanks have now been furnished with thickened plate-armor in front, the normal thickness being 60-mm for the front and 30-mm for the side and back plates.

More tanks mounted with 75-mm guns have been found. Special antitank self-propelling gun regiments have been formed, and the infantry provided with 28-mm rifles. Important changes in the Panzer divisional formations are also noticed. Formerly these had two tank regiments and one regiment of motorized infantry, but now the proportions are reversed, though the infantry has been provided with armored cars. Similar prudence in the use of tanks has been noted on the other fronts.

(The London Times Weekly)

A Close-up View of the Brake Muzzle of a gun mounted on the New Mark IV. Special German Tanks in the Western Desert.



More Detail of the Mark IV. Special and Its New Long-Barreled Gun. The Tank Was Knocked out During Fighting in Egypt.

ITALY

Army Equipment:

"Ejercito" of Madrid in the January, 1942 issue, gives an account of the armament and equipment of the Italian army according to a Spanish officer who had been sent to Italy in 1940. Rifle: Now being introduced, Model 38, caliber 7.35-mm, an improvement on Model 91. It is lighter, faster in handling, has greater muzzle velocity (757 meters) greater striking power and flatness of trajectory (highest point at 300 meters, 30 centimeters), weight of bullet 8.3 grams. It is used in round by round fire on living targets at 200 meters.

Light machine gun: "Breda" Model 30, caliber 6.5-mm, by changing barrels, can also use the 7.35-mm ammunition. Muzzle velocity 630 meters per second, rate of fire 150 rounds per minute, sight graduated up to 1,500 meters, air-cooled, cartridge bands 20 cartridges each, barrel change after each 200 rounds. Weight 10.6 kilograms. Each group has rifles and one light machine gun.

Heavy machine gun: "Breda" Model 37, caliber 8-mm, a robust weapon, weight 19.4 kilograms, muzzle velocity 780 meters per second. Maximum range at which its striking power is sufficient to put a man out of action, 5,800 meters at sea level, 6,400 meters at an altitude of 2,000 meters. Larger angle of traverse, air-cooled, sight graduated up to 3,000 meters, solid cartridge bands of 20 cartridges each. Highest point of trajectory at 600 meters 1.14 meters, penetration in pine, 12 centimeters at 4,000 meters range. Four different cartridges are used: (a) The usual "35" ammunition which is quite effective at short ranges, but is not used against planes. (b) The "39" cartridge, with greater penetrating power. At 200 meters it penetrates a steel plate 10-mm in thickness; at 600 meters, a steel plate of 6-mm thickness. Quite effective against tanks, planes and field fortifications. (c) The tracer cartridge which is used against mobile air and ground targets. (d) The registration cartridge which when used against ground targets, permits determination of the location of impacts. It alternates in the cartridge bands with the regular cartridges. Both in attack and defense the heavy machine gun is used in direct fire at ranges up to 1,000 meters and in indirect fire at ranges up to 4,000 meters. With air sights against air targets at ranges up to 1,000 meters.

Infantry and antitank cannon 47/32; Caliber 47-mm. It is carried but may be transported on a pack animal or carried by six men in separate loads. Used as antitank cannon, it fires an antitank projectile of 1.455 kilograms weight with a muzzle velocity of 630 meters per second and a maximum range of 7,000 meters. Practical range up to 700 meters. Used as an infantry gun it fires a projectile weighing 2.35 kilograms with a muzzle velocity of 250 meters per second, maximum range 3,500 meters rate of fire 7 to 8 rounds per minute, dispersion 6 meters at 500 meters, 22 meters at 1,000 meters.

Assault trench mortar: Caliber 45-mm. Fires a projectile of 465 grams which explodes on impact and is effective within a 20 meter radius. Two different trajectories may be used with open or closed valve. This gives a muzzle velocity of 59 or 83 meters per second respectively. The minimum range is 100 meters, the maximum 500 meters, maximum rate of fire 30 rounds per minute. Safety range in time of peace 100 meters, in time of war

60 meters. On account of its small size, it can find a location in any depression of the terrain and may be used at short ranges.

Trench mortar: Caliber 81-mm. Besides the projectile usually employed in other armies, also employes the G C shell with great effectiveness. It is able to penetrate armor. Its weight is 6.85 kilograms. It is used at ranges between 300 and 1,500 meters, has five charges with muzzle velocities of 45, 74.5, 97.5, 117 and 135.5 meters per second.

Altogether, each of the three rifle companies of the battalion has 12 light machine guns, the battalion in its accompanying weapon company has 8 heavy machine guns and 18 trench mortars, the regiment has a trench mortar company with 9 trench mortars and an infantry gun company with 8 guns and 360 rounds each, a third of which are armor piercing shells. The regimental baggage train consists of 4 columns, one each for the three battalions and staff and 1 column of transporting carriages for the trench mortars and accompanying weapon company.

In the way of communications apparatus: Radio stations are used only in the regiment which has 6 portable stations with a range of 3 kilometers for speech and 10 kilometers for code. They are equipped with dry cells, weigh 17 kilograms and have a service life of 7 days of 8 working hours. There is also a plane message receiving station which may also be operated while marching, with a range of 10 to 15 kilometers and a weight of 15 kilograms. It has a service life of 30 days of 16 working hours.

Telephones: Regiments and infantry gun companies each have a central exchange with ten circuits over which 5 different conversations may be conducted at the same time. Weight, 15.2 kilograms. In the way of telephones, the regiment possesses 8, the battalion 6, the trench mortar company 4, the infantry gun company 2. Each outfit is provided with dry cells good for ten hours of operation and weighs 3.8 kilograms. For each of them, 1 kilometer of cable in two rolls is carried along.

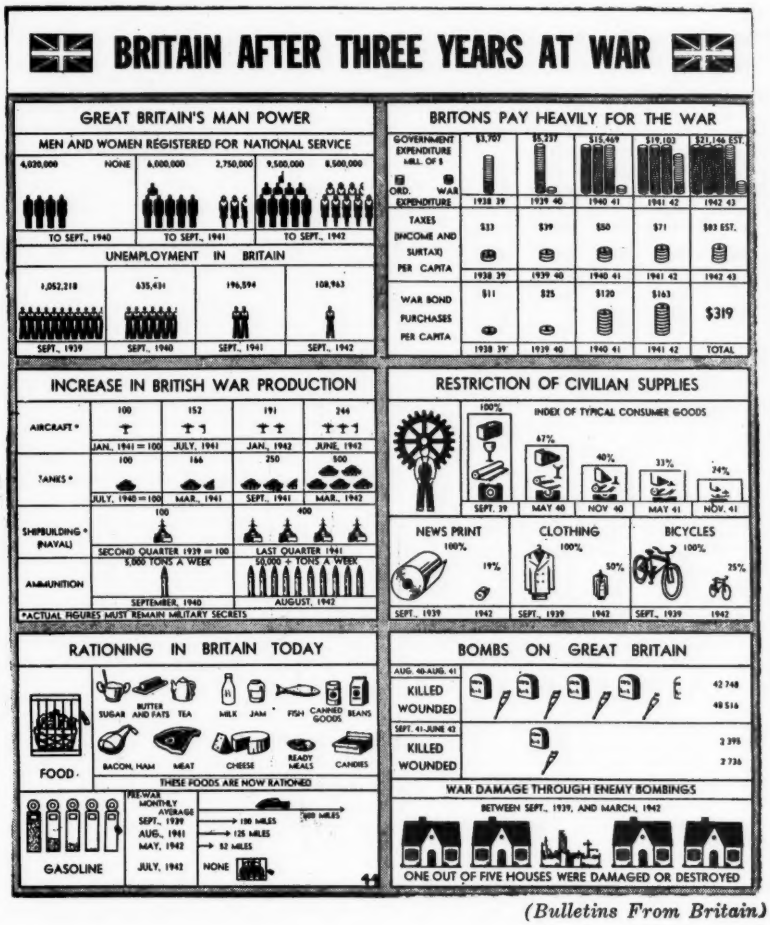
Light-signaling equipment: The regiment has 6 sets of instruments, the battalion 3, the infantry gun company 2. Weight with tripod 10 kilograms, length of life of dry cells, 5 days with 8 hours service per day. Range in day time, 4 kilometers, at night, 15 kilometers. In addition are found signal flags, flare pistols and rockets with a range of visibility of 3 kilometers in day time and 6 kilometers at night, also ground panels, motorcycles and bicycles. The regiment may be given 5 baskets with 10 carrier pigeons each which are replaced every 3 or 4 days.

(Militär-Wochenblatt)

GREAT BRITAIN

Ceylon Rubber Supply:

With the Dutch East Indies and Malaya, the British have lost much of their source of rubber supply. Now, help must come from all possible places. Great plans had already been laid for obtaining the rubber stocks of the Amazon region. Africa, especially the Congo region, is to come in for its share of attention. But nowhere are more than fractional parts of the lost rubber stocks to be found. Therefore, even the island of Ceylon is to help out now.



(Bulletins From Britain)

In 1940, Ceylon produced around 90,000 tons of rubber. Now the output is to be increased by every possible means. This is first to be brought about by increasing the yield of the existing plantations without tapping the trees. Thoughts are being turned to the establishment of new plantations and in doing this encroachment would be made on the great tea plantations. Ceylon, which up to the present, along with India was one of the greatest tea growing countries on earth, with an annual production of some 100,000 tons, is now to become a great rubber producing country. But that will take a long time for rubber trees are not ready to tap until they are several years old. Experts do not believe that for the next few years the production can be increased to much over 100,000 tons.

From the point of view of one of her mineral products, Ceylon is also a very important country for the British war industries. It contains the greatest deposits of graphite known anywhere on earth. Before the war, the exports were 235,000 Zentner (about 12,925 tons). By 1940 they had increased to 480,000 Zentner (about 26,400 tons). In 1938 England got 39,000 Zentner (about 2,142 tons) of graphite from Ceylon. In 1940 it was 170,000 Zentner (about 9,350 tons). During these same years, 50,000 and 118,000 Zentner (about 2,750 and 6,490 tons) respectively went to the United States. All possible efforts are being made to increase deliveries. More than 20 new mines have been put into operation.

(Deutsche Wehr)

Britain's Food Rations at a Glance:

	Item	One Person	Family of 2	Family of 3	Family of 4
Per Week	Bacon and Ham	8 ounces	1 pound	24 ounces	2 pounds
	Cheese	1 4/16 ounces	6 8/16 ounces	9 12/16 ounces	12 16/16 ounces
	Sugar	½ pound	1 pound	1½ pounds	2 pounds
	Fats	2 ounces	¼ pound	6 ounces	½ pound
	Bacon	¼ pound	½ pound	¾ pound	1 pound
	Meat	23¢ worth	46¢ worth	70¢ worth	93¢ worth
Per Month	Jam or Honey	1 pound	2 pounds	3 pounds	4 pounds
	Canned Foods	24 points	48 points	72 points	96 points

(Bulletins From Britain)

JAPAN

Health of Japanese Troops:

The state of health of Japanese troops in Malacca and the other tropical regions, in spite of the fact that the troops are not accustomed to it and the climate is dangerous, is reported to be excellent. Especially as a result of the summer campaign in central and southern China, extensive precautionary measures have been adopted. During the attack on Hankow, the number of men sick with malaria had been much greater than the number of those wounded. Now malaria is guarded against by a careful choice of

camp sites (as dry as possible and removed from mosquito breeding places) and by the adoption of preventive measures. Preventive measures are also taken against cholera, skin diseases and four or five dangerous kinds of fever. The troops carry serum for use in case of snake bites. Great pains are taken to provide safe water. The troops carried filtering apparatus even during the Chinese campaign. In Malacca in case of water shortage the troops rely on coconuts, other sappy fruits and a species of tree from which water may be obtained by removing a portion of the bark.

(Militär-Wochenblatt)

Ski Troop Training:

The training of ski troops has been started by the military authorities in cooperation with the "Skiing Club," "Mountain Climbing Club" and the Ministry of Railways. The first course lasted from 17 January to mid-March.

(Frankfurter Zeitung)

Tanks—Guns:

As a medium tank, the Japanese first used the 11.1-ton Vickers M.K.C. tank, from England, which is equipped with a 57-mm cannon and 4 machine guns and is heavily armored. From this they next developed the very efficient 14-ton tank which is equipped with a cannon and 2 machine guns and was used in the Chinese war in 1932 and is now being used again in the present conflict with China.

As to light tanks the Japanese had already used in the Chinese campaign, a 7 to 8-ton Etsu tank, developed from the French-Renault NC 27 tank whose mobile turret is equipped either with 2 machine guns or one armor piercing cannon and one machine gun. It is no longer being manufactured now, and is replaced with a Japanese development, a small tank equipped with one cannon.

In addition, the Japanese posses a 3 to 4-ton tank, the M 2592 which according to Heigl, "Hand-book of Tanks, 1935" is equipped with a 20-mm cannon in the turret and has a crew of two men. It also has been replaced in the present war.

The Japanese 75-mm mountain cannon, Model F, has a barrel of 1.44 meters (L/19.2). Its elevation ranges from minus 8 to plus 25 degrees, its traverse covers 7 degrees. According to "Schweitzer Artillerist" the gun in firing position weighs 680 kilograms.

Japan also has a somewhat lighter mountain cannon available, the 75-mm Meiji 41 mountain cannon which with a projectile of lesser weight, 5.5 kilograms, and the higher muzzle velocity of 440 meters per second, attains the greater range of 6,500 meters. Its elevation may be varied between minus 10 and plus 35 degrees. Since the gun tube possesses a length of only 14.5 calibers (1.08 meters) the gun weighs but 550 kilograms in firing position.

For close defense, the Japanese artillery is strongly equipped with machine guns. The light artillery regiment of 2,700 men of an ordinary division, according to "Ejercito" (March 1942) has 138 machine guns at its disposal, and the light artillery regiment of 2,600 men of a light division, has 72 machine guns available. There is, accordingly, one machine gun for each 20 or 36 men, respectively.

(Militär-Wochenblatt)

War Economics:

Present situation as regards Japan's own production of necessary supplies is represented by the following figures: Annual rice surplus in conquered regions is estimated at 300,000 tons. This is not destined for Japan alone, but is to serve as a general reserve for the eastern Asiatic area. Japan will continue her efforts to produce her own necessities, in order to avoid dependency in any respect. Self-sufficiency is not yet established in the field of textiles since the conquered regions produce but little wool and cotton. Chinese cotton production which at one time was 600,000 tons, has dropped to about a half of this quantity, but is slowly increasing again. It will not be adequate, however, under any circumstances. Additional cotton plantations are planned for the southern area, as a result of this situation. There are still great stocks of artificial silk and cotton cloth in Japan so that in addition to being able to cover her own needs, she is able to export these materials to the south. The great area possesses a large surplus only of hemp, which is to be stored. The first development program for Manchukuo, with emphasis on heavy industries, came to an end with the present fiscal year. A second plan is being worked out in accordance with the needs of the great area, agriculture receiving as much attention as heavy industry. Coal mining and soy bean production are to be particularly developed. The supply of fish and meat is satisfactory. The raising of hogs in Japan increased by 50% in 1942. The cattle situation is unchanged. Fishing which at first hal fallen off, is again on the increase mainly on account of a greater abundance of fuel oil.

(Militär-Wochenblatt)

The Weapons in Japanese Infantry Organizations:

	Weapon	Sqd.	Platoon	Company	Battalion	Regt.
(1)	Rifle	13	52	156	472	1485
(2)	Lt. MG	1	3	9	27	81
(3)	Pistols	2	12	46	127	423
(4)	Grenade Dischargers		4	12	32	96
(5)	Auto Rifle					
(6)	Carbine					
(7)	60-mm Mortar					
(8)	Hy MG				6	18
(9)	70-mm Gun				2	6
(10)	37-mm Gun				2	6
(11)	Saber				72	232
(12)	81-mm Mortar					
(13)	Cal. .50 MG					
(14)	75-mm Gun					4

RUMANIA

Casualties in Russia:

Rumanian casualties during the first year of war against the Soviet Union: Dead, wounded and missing: altogether, 5,998 officers, 2,633 noncommissioned officers, 148,941 men. Seventy per cent of the total casualties recovered and became again fit for combat. Of the casualties, 20 per cent occurred during the operations in Bessarabia and the Bukovina, 63 per cent in the operations between the Dniestr and the Bug and in the capture of Odessa, 5 per cent in the operations between the Bug, Dniepr and the sea of Azov, 12 per cent in the operations of the year 1942, that is Kerch, Donets and Sevastopol.

(Militär-Wochenblatt)

SPAIN

Tanks:

The light tank, designed by the Spanish officer, Captain Verdeja and named after him, in addition to two machine guns, is also equipped with a 45-mm cannon. This is built into the turret and has unlimited traverse (360 degrees) and elevation up to 75 degrees. According to "Ejercito," the tank carries a crew of 3 men and is radio equipped.

(Artilleristische Rundschau)

SWITZERLAND

Oerlikon Weapons:

The Oerlikon machine tool works manufactures, in the "arms and ammunition department," infantry and antiaircraft guns, naval armament, plane armament and ammunition, all of 20-mm caliber. These weapons are manufactured not only for the Swiss armed forces but also for export to Bulgaria, Italy, Portugal, Sweden, etc. The 20-mm, Model "S" cannon, with a 70 caliber length of barrel, fires projectiles of 0.128 kilograms (slightly over one-fourth pound), with a muzzle velocity of 830 meters per second, a distance of 5 kilometers horizontally and 3.7 kilometers vertically. Magazine loading gives a rate of fire of 280 rounds per minute. Different mounts are provided for the 62 kilogram weapon, depending on its use. With the ILaS mount, (illustration No. 1) the gun in

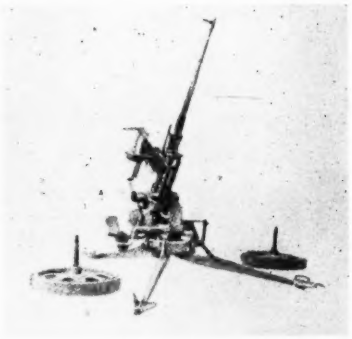


ILLUSTRATION No. 1.

ILLUSTRATION No. 2.

firing position on its tripod mount, weighs 360 kilograms. Three men are required as crew. The gun is made transportable by putting on the two wheels (illustration No. 2). For mounting on a motor car, the model PLaS is used, a pedestal mount of light construction which gives a weight when ready for fire, of 240 kilograms. The antiaircraft cannon, Model SLaSS (illustration No. 3), has a pedestal mount of heavier construction and is intended as ship's armament. With this design, the complete cannon weighs 600 kilograms. The gun has drum feed permitting a rate of fire of 500 rounds per minute. The 20-mm airplane wing cannon, Model FF (illustration No. 4), is operated from the pilot's seat. Cartridge drums are pro-

vided with capacities of 45, 60, 75 and 100 rounds. The weapon weighs 23 kilograms. The 20-mm motor cannon, Model FFS/MK, which fires through the propeller hub, on account of its longer barrel, weighs 49 kilograms and reaches a muzzle velocity of 830 meters per second. The rate of fire and feed apparatus are the same in the case of Model FF. As stern cannon, (illustration No. 5), Model HLaF with 600 meters per second muzzle velocity and a weight of 54 kilograms is used.

(Militär-Wochenblatt)

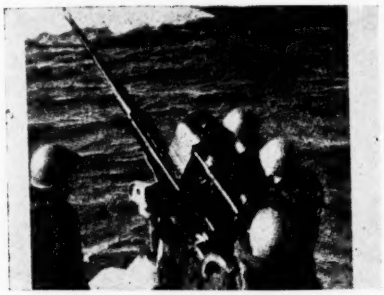


ILLUSTRATION No. 3.

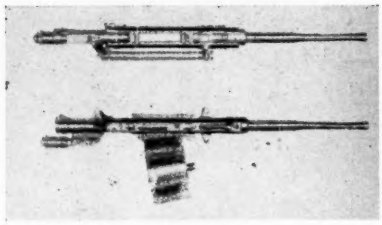


ILLUSTRATION No. 4.

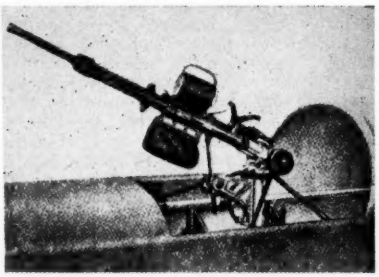


ILLUSTRATION No. 5.

The 34-mm AA Gun:

In firing position the wheels of this automatic, AA cannon, are raised, permitting the gun to rest on a four point support. The tube is water-cooled. According to "Deutsche Wehr," is has rate of fire of 100 rounds per minute. According to the book, "Twenty-five Years of Swiss Aviation" (Zürich, 1939) the cannon is an experimental gun. It is questionable whether it will be adopted as with a weight of 2,600 kg it is very heavy and in short range fire is perhaps not sufficiently mobile.

According to "Deutsche Wehr," the 20-mm AA cannon, the Oerlikon, (L/70), in contrast to the 20-mm AA cannon of the Bern Arms Works, has a rate of fire of 280 rounds per minute.

(Artilleristische Rundschau)

TURKEY

Start of Aircraft Production:

The first airplane to be built in Turkey, a product of the Etimesut Works at Ankara, executed its first flight in the presence of the Minister-President and various associated members of the cabinet.

(Militär-Wochenblatt)

UNITED NATIONS vs THE AXIS

The Switch of the Haves and Have-Nots —(Percentages of World Production of Raw Materials):*

	Axis		*Allies*	
	Now	*3 Yrs. Ago*	*Now*	*3 Yrs. Ago*
Rubber	90	0	10	50
Tungsten	67	0	33	32
Phosphates	29	0	71	70
Cotton	13	0	87	70
Nickel	2	0	98	97
Tin	74	3	26	63
Petroleum	10	1	90	64
Manganese	48	8	52	40
Wheat	40	10	60	40
Lead	24	9	76	58
Sugar	36	14	64	45
Copper	12	5	88	54
Coal	53	29	47	53
Steel	33	21	67	44

*For the "have-nots," the figures three years ago arbitrarily embrace Germany, Japan and Italy; for the "haves," the United States, the British Empire, and France. Current figures are the present line-up of the United Nations against the Axis, with neutral or conquered resources divided between opposing spheres of influence. For example, 35 per cent of world rubber controlled by the Netherlands Indies, not in the Allied line-up three years ago, now shows up in the Axis column.

NOTE: The economic implication of the recent Allied successes in Africa are not covered by this table. (Ed.)

("Newsweek")

U. S. A.

Health of the Army in the United States During Winter Months:

Admission rates per 1,000 per annum for the winter period November to February, inclusive, U. S. Army in the United States.

	All Causes	*Disease Only*	*Respiratory Diseases*
1940-41	1,539	1,403	936
1941-42	776	668	278

These figures show a 50 per cent reduction in admissions all causes, 52 per cent for disease only, and 70 per cent for respiratory infections. These reductions translated into days represent a decided addition to the war effort, not to mention the effect on morale and well being. Numerous factors, known and unknown, combined to produce such satisfactory results. Among known factors we may suggest the following:

1. Health conditions throughout the United States were very good, despite the marked changes due to war, and no extensive epidemics occurred.

2. The Army was composed of seasoned troops who had months of rigorous training in camps and maneuvers. New men were absorbed in old units.

3. The Surgeon General insisted on limiting the increase in the Army to the facilities available for housing, supply, hospitalization, etc.

4. The preventive measures enforced in the Army to assure proper food, potable water, adequate clothing, ventilation, heating, and wholesome exercise and amusement.

As to continuance of the favorable health conditions experienced we can only keep on the alert with fingers crossed and pray.

(The Army Medical Bulletin)

The Alaskan Airway:

Radio beams are now in operation along the air route from Edmonton to Alaska and full radio facilities are available for commercial and military airplanes. Work on the chain of airdromes to Alaska was rushed because of the war in the Pacific and military airplanes from the United States are flying to Alaska by way of Canada.

(The Aeroplane)

U. S. S. R.

The Airplanes of the Red Air Fleet:

Now that the air forces of the U.S.S.R. have been in action against the Luftwaffe for many months, new facts have come to light, mostly by way of Germany, on the newer types of Russian aircraft. These types, which have largely replaced the older and more familiar types, include the Stormovik dive bomber and ground attack monoplane, the MIG-3 fighter, the Yak-4 and PE-2 light bombers, and the SU-2 fighter-bomber. All of them seem to be of high quality, and the light bombers in particular appear equal to those in service anywhere in the World. Russia has obviously concentrated on close support types for co-operation with the Army and has rather neglected the heavy bomber.

Fighters:

Two new types are in service, the I-26 and the MIG-3. Both are low-wing single-motor monoplanes with inward retracting undercarriages.

The I-26, which is somewhat similar to the Hurricane, has a 1,100 h.p. M-105 liquid-cooled Vee motor and an armament of two machine-guns and a motor-cannon.

The MIG-3, known earlier as the I-18 and now also known as the I-61 and I-200, is said to be the latest Soviet fighter, but there are certainly still newer types coming into service. The MIG-3 is a low-wing monoplane with the wing slightly swept down from the wing-root to the undercarriage pivot point. The fuselage is short with the pilot's cockpit placed well back towards the fin. The 1,200 h.p. AM-35A liquid-cooled Vee motor gives the MIG-3 a top speed of about 360 m.p.h. The armament, according to German sources, is one heavy and two light machine guns. It has probably been increased recently.

Ground Attack and Dive Bombers:

The Stormovik, mentioned first by Lord Beaverbrook after his visit to Moscow, is designated the IL-2 (BSch) and is a low-wing single-motor single-seat monoplane with backward retracting undercarriags. It was developed from the Heinkel He 118, but is also similar in appearance to the Fairey Battle. The Stormovik has a 1,300 h.p A.M.-38 liquid-cooled Vee motor. The motor and cockpit are specially armored for low-level attack, and the IL-2 is reported to have been highly successful against tanks. There are two 32 mm. cannon and two machine guns in the leading edge of the wing.

The SU-2 (BB-1) is a low-wing two-seat fighter-bomber with a rear gun tur-

ret, on the lines of the Brewster Bermuda. The motor is a 1,000 h.p, M-88 air-cooled radial. The bomber version has two forward machine guns in the wing, and one free gun in the rear turret. There is believed to be a single-seat fighter version with four forward guns.

Another machine in service is the SB-RK, which is really the SB-3 with modified radiators and Ju 88 type dive-brakes under the wings. The motors are 1,100 h.p. M-105 liquid-cooled Vees.

Light Reconnaissance Bombers:

The two new types of reconnaissance bomber are very similar in appearance. They are the YAK-4 BB-22 and the PE-2 The former is the smaller of the two; both are low-wing two-motor monoplanes with twin fins and rudders and retractable undercarriages. The tailpiece on both types is dinedral. The YAK-4 carries a crew of two. A point of distinction between it and the PE-2 is that the motors of the YAK-4 protrude in front of the nose. The M-105 12 cylinder liquid-cooled Vee motors develop 1,100 h.p. each. There is a dive-bomber version —the BB-100 and it is also used as an attack bomber.

The PE-2 carries a crew of three or four and has a large area of glass under the nose. The bomb-load of about 1,700 lb. is sowed internally. The top speed is believed to be slightly more than 300 m.p.h.

Seaplanes:

The most used flying-boat is the GST, which is the Consolidated 28 built under license, fitted with front-gun turret and special motor cowlings similar to the 1-16 Rata.

Although possibly not very new, a type which has not been previously mentioned is the KOR-1 seaplane. This machine looks like a two-seat biplane version of the I-16 Rata monoplane on a large central float with two small wing-tip floats. It is used for catapault operation from ships of the Black Sea Fleet.

There is also a four-motor flying-boat in existence, but no details are available.

The principal operational types in the Red Air Fleet now appear to be:—

Fighters:	*Heavy Bomber:*
I-153 Chicka	TB-6B
I-16C Super Rata	
I-17 (CKB-19)	*Transport:*
I-26	PS-35 (Ant-35)
MIG-3 (I-61, 1-200, I-18)	PS-84 (DC-3)
	PS-89
SU-2 (BB-1)	
Light Bombers:	*Ambulance:*
SU-2 (BB-1)	U-2
YAK-4 (BB-22)	
PE-2	*Marine:*
	MDR-5
Medium Bombers:	GST (Consolidated 28)
SB-2	ARK-3
SB-3	KOR-1
DB-3 (CKB-26)	
DB-3F	
Dive Bombers:	
IL-2 (BSch Stormovik)	
SB-RK	
BB-100 (Modification of YAK-4)	

(The Aeroplane)

The Caucasian Front:

The map of the Caucasus, showing the military roads and passes to the south, over the mountains, with the oil pipe-line between Baku and Batum, illustrates the terrain difficulties which, coupled with

Illustrated London News

effective Soviet resistance, have stalled the German drive. These difficulties will multiply with the advent of severe winter climate which is characteristic of the region. (Ed.)

Political Commissars Abolished:

By a degree signed by Mikhail Kalinin, President of the Supreme Council of the U.S.S.R., published on October 10, 1942, the political commissar system prevalent in the Red Army since 1918 has been abolished.

Supplementary decree issued by Joseph Stalin, Commissar of Defense, formally relieved the commissars of their duties which included direction of entertainment, maintenance of morale and political instruction. The supplementary decree directed that all commissars be given officers' ranks within one month. Those of the commissars who lack experience in combat tactics to be ordered to undergo two-month training courses.

(Press Reports)

Mortars:

The infantry is equipped with light, medium and heavy trench mortars which, according to *Wehrtechnische Monatshefte,* are of modern construction.

The light, 51-mm, M-40 trench mortar is a muzzle-loading mortar consisting of tube, bipod, laying mechanism and base plate and a total weight of 22 kilograms. The traversing mechanism permits an angle of pintle traverse of 30 degrees to right and left. The minimum range is 60 meters, with an elevation of 75 degrees. The range is 800 meters, with an angle of elevation of 45 degrees. The maximum rate of fire for the mortar is 30 shots per minute. According to the Russian Manuals, it throws a spherical projectile of 0.9 kg weight whose fragmentation effect is effective over an area of 300 sq. meters. One man carries seven projectiles in a case on his back. (For the sake of comparison, we call attention to the English M-11 1939 51-mm trench mortar which weighs 9.5 kg. and with an elevation of 45 degrees, fires the 1 kg explosive missile a distance of some 430 meters.) The medium, 120-mm trench mortar, model 38, also consisting of tube, bipod, laying mechanism and base plate, according to *Nieuwe Rotterdamsche Courant* of 29 October, 1941 is loaded onto a two-wheeled, rubber-tired carriage for change of position. This carriage is attached to a limber.

(Artilleristische Rundschau)

Infantry Equipment.

In the infantry equipment are found, among other things, machine pistols with a caliber of 7.62 millimeters with drums with a capacity of 71 shells, arranged for single shots or steady fire. They are often used in tanks. The self-loading rifle, the Simonov model, has a caliber of 7.62 millimeters, weighs four and a half kilograms and has a rate of fire of 20 rounds per minute. The magazine holds 15 cartridges. The light machine gun, Degtyarev model, a gas-operated, aid cooled gun, weighs 8.4 kilograms and is also used as armament in tanks. Shells are supplied from drums holding 60 shells. Rate of

fire, 550 rounds per minute. The tank gun has a caliber of 12.7 millimeters, is equipped with recoil brake, fires semi-automatically and weighs 25 kilograms. For the 7.62-mm caliber (rifle and machine gun) explosive ammunition is available. The bullet is 40 millimeters in length. Under the 0.5 millimeter jacket, is a lead jacket which is broader at the base and contains an explosive capsule of copper alloy, 11.5 millimeters long by 6.5 millimeters in diameter. In the explosive capsule there is a steel rod 4 millimeters in length which, on impact, strikes the explosive capsule which then causes the projectile to explode. The explosive ammunition was provided for planes, machine guns and AA weapons but is also employed against living targets. Shells are fired from a type of firing apparatus, on the rocket principle. The firing apparatus holds 42 projectiles arranged in three superimposed rows. The firing apparatus is mounted on a motor truck.

(Militär-Wochenblatt)

The 152-mm Howitzer:

The 152-mm cannon howitzer is a split-trail gun with shield. The tube has a muzzle brake and when tractor-drawn is drawn back for better weight distribution. Powerful equilibrators are necessary in order to compensate for the weight of the excessively forward thrust barrel. A range of 17 kilometers (about 10.6 miles) is obtained with a 45 kilogram (about 99 pound) projectile. A two-wheeled limber is necessary in transportation. For the transportation of the heavy howitzer which, ready for transportation weighs 7,000 kilograms (about 15,400 lbs.) a caterpillar tread tractor is employed which develops a speed of 20 km per hour.

(Militär-Wochenblatt)

The Second World War

[This survey covers reports up to 10 December 1942.]

The War in Europe

The Russian Front.—The summer campaign of the German armies, which began late in June, had carried the swastika by 1 September close to Hitler's principal goals. Of the Nazi objectives still remaining to be attained the most important was Stalingrad, the seizure of which would end the flow of Russian supplies along the great transportation route of the Volga. Far to the south the German line extended for more than three hundred miles along the foothills of the Caucasus. At the western end of this line the Russian naval bases at Novorossiisk and Tuapse on the Black Sea were yet to be taken, while at the eastern end the oil fields of Grozny lay only about sixty miles from the Nazi spearheads, with the Caspian another ninety miles beyond.

Early in September, Stalingrad on the Volga appeared to be doomed with powerful German mechanized forces on its very outskirts. It seemed impossible that the Russians could long continue to hold the ruins of their city, but nevertheless they fought ferociously for every street and every building, struggling at bayonet's point even from room to room. Time after time Moscow admitted German advances and the invaders, moving forward street by street, finally claimed that they had reached the river itself at several points within the city. The Russians, however, never devoted their efforts merely to defense. Their counterattacks were almost continuous not only in front of Stalingrad but also upon the Nazis' northern and southern flanks between the Volga and the Don, and in the region of Kletskaya seventy-five miles northwest of Stalingrad within the great bend of the Don.

During September the Russian counterattacks appeared to gain little, but early in October they seemed to become increasingly effective especially on the Germans' forty-mile northern flank extending from the Volga to the Don. Moderate successes were also reported in drives against the Nazis' southern flank. Although the Germans were still making short gains in their direct attack upon Stalingrad, the Berlin radio on 8 October announced that the High Command, to avoid "unnecessary sacrifices," had adopted new tactics—artillery and air bombardments were to be employed rather than frontal assaults by tanks and infantry. During the rest of October and the first half of November the Russian flank attacks made no spectacular gains, but as the weeks passed it began to appear that Stalingrad, believed for two months to be doomed, might yet hold out.

Then on 22 November the Russians launched their full force against the German flanks northwest and southwest of Stalingrad. In both areas the German lines gave way. In the north the Russians drove far into territory formerly held firmly by the Germans, reaching and crossing the Don west of Stalingrad and continuing well beyond it. The two railway lines that the Germans had used to supply their forces were both broken by the advancing Russians. According to reports at the end of November, there remained only a corridor about twenty miles wide through which the Germans could make contact with their estimated 300,000 men before Stalingrad. But in spite of these impressive Russian gains, the Germans showed no inclination to withdraw from their positions before the city although in early December their chances of taking it seemed remote.

Meanwhile, far to the north and to the south of Stalingrad other sectors of the 2,000-mile front were also active. Novorossiisk, the principal Soviet naval base on the Black Sea, was claimed by the Germans on 6 September, the Russians admitting its loss six days later. German drives then continued along the coast and through the mountains toward the lesser naval base at Tuapse. For three months reports of fighting in this area indicated German advances and Russian counterblows, but December found Tuapse still in Russian hands.

From their positions in the foothills of the Caucasus the Germans launched drives into the passes of the great mountains using specially trained mountain troops. There appeared no evidence, however, that any substantial German successes were achieved.

At the eastern end of the Caucasus line the struggle to advance the German spearheads toward the Caspian continued persistently, yet in December the Nazis had succeeded in pushing only a few miles to the south and east of the line they held at the beginning of September. Their drives along the Terek River toward Orjonikidze and Grozny apparently

failed to change the situation materially, and the oil fields of the eastern Caucasus still remained well beyond their reach. By early December they had apparently lost the initiative in this area, but they still held firmly the positions they had won, and it seemed that the Russians lacked sufficient power to drive them back.

Far to the north of Stalingrad the Russians struck again and again at the German lines, apparently hoping to compel the diversion of troops from the Stalingrad front. Russian efforts in the area around Voronezh 250 miles northwest of Stalingrad, at Rzhev west of Moscow, and in the Leningrad sector still farther north produced only minor gains and it seemed evident that Soviet offensive power was insufficient to win decisive results. Early in November, however, Berlin began to report increasing Russian concentrations north of Moscow, and these reports continued to be issued with growing emphasis as it became evident that the Russians were preparing a drive of very considerable proportions. In the middle of the month an attack was launched against the German arm encircling Leningrad, and Berlin admitted the loss of some territory. Late in November powerful Russian drives in the Rzhev sector were reported to have forced the Germans back several miles. In early December it was not yet clear, however, whether the Nazi reverses were to be attributed entirely to Russian striking power, or whether the Germans were withdrawing to a prepared "winter line" somewhere in the rear as they did in the winter of 1941.

In spite of the great areas taken by the Germans in their Russian campaign of the summer and autumn, it did not appear that there had ever been an actual German "breakthrough" or that a Russian army had ever disintegrated before the invaders. The long Russian retreats had apparently been carried out without confusion or collapse of rear communications, and the Russians had found it possible to bring up reserves, supplies, guns and planes all along the line. And now in early December they had evidently taken the initiative from the Germans and were on the offensive at every point of action on the entire front. The Germans on the other hand were apparently being forced upon the defensive without having gained the ultimate objectives of their summer campaign: they had not reached the principal oil fields in the south, they did not control the Caucasus, they had failed to take Stalingrad or to dominate the Volga, and above all they had failed not only to destroy the Russian armies but also even to weaken them sufficiently to remove them as a potential threat.

Western Europe.—The Allies' air war on Germany and occupied Europe continued persistently through September and much of October. The Royal Air Force conducted a raid on an average of every other night, and while none probably reached the thousand-plane magnitude of some earlier raids, immense damage was inflicted by the use of the powerful new "block-buster" bombs. As usual, Bremen and the cities of the Saar industrial district came in for a major share of attention, but many other important centers were also visited. Meanwhile, the Americans with their Flying Fortresses were highly successful in daylight precision bombing over Nazi-occupied areas near the coast, and far to the east Russian long-range bombers attacked many points including Danzig, Koenigsberg, Budapest, Bucharest, and the Rumanian oil fields.

In October there appeared to be a decline in British air attacks on Germany as the big bombers, according to a British statement, were diverted to Egypt to support the Allied forces in their approaching drive on General Rommel's army. Italy, however, came in for an increased number of bombings. On 22 October there occurred the greatest air attack yet launched against that country, and within about a month thereafter, thirty-five heavy raids were directed against Genoa, Turin and Milan. Through the destruction of Genoa's port facilities and many northern Italian armament works, these raids must have contributed considerably to the weakening of Italy's efforts in resistance to the Allied invasion of North Africa in November. The air attacks continued into December and mass evacuations were reported from Italy's industrial areas.

In Unoccupied France, German efforts to conscript French labor for service in Germany met with little success and aroused widespread resentment. There were reports of strikes, sabotage, demonstrations and civil strife; but the Vichy government with Pierre Laval virtually dominant continued to insist upon "co-operation" with the Nazis.

On Armistice Day, 11 November, a few days after the Allied invasion of North Africa, the Germans suddenly dashed into Unoccupied France and proceeded to occupy it except for a section in the southeast which was seized by the Italians. There was no effective opposition and the Germans apparently kept the situation well in hand. On 27 November, however, when they attempted to seize the sixty-four vessels of the French fleet at Toulon, the French acted too quickly for them and destroyed the greater part of the fleet. Many of the ships were blown up, some that failed to explode were sunk by gunfire, at least one blew up when it hit a parachute mine while attempting to escape, and a few got away. One submarine was later interned in Spain, and three others were reported to have joined the Allies.

In December, Marshal Petain's Vichy government was in a very doubtful position, for Unoccupied France had ceased to exist, and while the aged Marshal continued to talk like the ruler of France the whole country in fact had been placed under the forceful control of Nazi Field Marshal von Rundstedt.

Unrest and Resistance.—Throughout Europe there were reports of unrest as the peoples looked forward to another winter of hunger and cold. The relations of Germany with both Sweden and Switzerland occasionally showed signs of deterioration. In Spain the changes made early in September in General Franco's

cabinet apparently left it as pro-Axis as ever, and its first pronouncement strongly reaffirmed the "imperatives of the New European Order." Yet in November Franco was reported to have refused Hitler's request for bases in Spain and to have asserted that his country was prepared to defend herself from attack by either side. Turmoil in both Rumania and Bulgaria was said to be approaching open insurrection as Germany increased her demands upon those countries. Martial law was declared throughout Serbia. Albanian patriots fought Italians for their national independence, and General Draja Mihailovich with an estimated 150,000 men held out in the mountains of Jugoslavia and caused the Axis an abundance of trouble, while the Partisans (Jugoslav People's Army), strong in Slovenia and western Bosnia, caused trouble not only for the Axis powers but also for the Serbian Nationalists supporting General Mihailovich. Italian popular antipathy to the war was believed to be mounting, and the belief was strengthened by Mussolini's admonitions to his people on the subject of declining morale. In occupied Europe reports of violence employed both by and against the Nazis continued to be frequent, although no conquered people in Europe was yet in a position to take decisive action against the conquerors. The New Order was apparently producing general disorder wherever its influence extended outside of Germany.

The War in North Africa

Egypt and Libya.—Throughout the months of September and October the forces of the Axis faced those of the Allies in the bottleneck between the Egyptian coastal town of El Alamein and the Qattara Depression forty miles to the south. On 31 August, General Rommel threw his German armored units against the Allied line just north of the Qattara Depression, apparently with the intention of sweeping seaward in the Allied rear and demolishing his opponents as he had done at Bir Hacheim in May. This time, however, the British crushed his advance with an overwhelming force of artillery, tanks and planes. A few days later Rommel was back where he had started, and it became increasingly evident that his effort had cost him a disastrous price. His losses were difficult to replace, for while his supply lines from Europe were relatively short they were extremely vulnerable to Allied attack and the Allied air forces never ceased to pound them on land and sea. Meanwhile, over the long, slow route around Africa, supplies and reinforcements flowed in steadily behind the Allied lines.

On the night of 23 October the Allied forces opened the battle with several hours of all-out artillery bombardment to prepare the way for the forward movement of infantry which began before dawn the next day. At first the advance was conducted cautiously until the possibility of breaking the Axis line could be definitely ascertained. The Allies' artillery soon proved by far the more powerful, their control of the air was complete, and the Royal Air Force gave well-coordinated support to the slowly advancing ground forces.

For twelve days the battle continued with heavy pressure upon every point of Rommel's front. Then on 4 November Rommel's line cracked and his forces began a general retreat that rapidly became a rout. The commander of the renowned Afrika Korps, General von Thoma, was captured, and Rommel's second in command, General von Stumme, was killed; but a considerable portion of the Axis forces escaped the British grasp and headed westward along the sea. It was expected that the retreating forces would make a stand at some defensible point on the Egyptian coast but under the pounding of the Royal Air Force and with the British hot on their heels the Germans rushed on into Libya. A British attempt to cut off the fleeing Nazis by a dash southwestward toward Agedabia barely failed of success, and Rommel with several thousand Germans and Italians succeeded in reaching the bottleneck at El Agheila between the sea and the salt marshes.

The British, meanwhile, found themselves with their supply route tremendously lengthened, and their problems were complicated by rains that bogged down their motor vehicles and grounded their planes. In early December they were struggling to draw up troops and supplies for what might prove to be the final effort to expel General Rommel from Africa. Whether Rommel would attempt to meet an attack at El Agheila or would try to escape either toward Tunis or overseas remained to be seen.

Morocco, Algeria and Tunis.—While the world's attention was fixed on the struggle with General Rommel, one of the most dramatic episodes in the Allied war effort suddenly occurred in northwest Africa when the forces of the United Nations launched their surprise invasion of Morocco and Algeria on the night of 7 November.

Plans for such an invasion had been under consideration since the beginning of the year together with plans for an invasion of Europe, and President Roosevelt and Prime Minister Churchill discussed these matters when the latter visited Washington in June. In July the project for a European invasion was abandoned for the present, although announcements concerning a European "second front in 1942" continued to be released. By the end of July fundamentals had been decided upon for the expedition into North Africa and landing points had been chosen. In August the date of the invasion was fixed and Churchill, on his visit to Moscow in that month, laid the plan in full before Stalin.

Early in September, Rommel's defeat in his attack on the Allied lines at El Alamein assured the security of Egypt and left the way open for a two-way thrust across North Africa from Egypt and from the Atlantic. Meanwhile, intricate diplomatic preparations were under way, of which little is yet known. In October, Lieutenant General Mark Wayne Clark of the American forces in Britain, accompanied by seven men, landed from a submarine on the North African coast to get information and see what support could be expected from the French officers there. He met the French at night and was nearly captured and then nearly drowned in the course of a hairbreadth escape.

The Axis was not unaware, of course, that significant preparations were under way, but evidence indicates that the actual course and speed of the invasion came as a surprise. At the end of September, Axis reports stated that the Allies were preparing to seize Dakar. Large-scale British landing exercises were observed at Gibraltar. There was an extensive evacuation of women and children from Dakar and considerable reinforcements, both military and naval, were rushed there. The threat to the city seemed to increase throughout October as news came out of the massing of American and British combat forces along the Allied coast of West Africa from the Belgian Congo all the way to Gambia, less than a hundred miles from Dakar. In mid-October a large Allied convoy was discovered near the Cape Verde Islands, heading apparently for Dakar, but the ships were later reported to have landed an expeditionary force in Liberia.

When, on the night of 7 November, the great invasion was suddenly launched, the plan was evident at once. Dakar was to be ignored for the present while the Allies pounced in force upon Casablanca, Oran, and Algiers, the cities which are the key points of the whole railway, highway, and airway system of North West Africa, as well as the controlling centers of the economic and political structure of the area. The conquest of Morocco and Algeria was essentially completed within less than four days. The chief of Vichy's armed forces, Admiral Darlan, "happened" to be in Algiers at the time, and thanks to his orders that city was taken within sixteen hours after troops landed near by. Casablanca put up the stiffest resistance but was soon reduced to submission. Oran fell after opposition was overcome on 10 November.

British fleet units rapidly advanced upon Tunisia, while British First Army troops landed at Bône, sixty miles from the Tunisian border, and American motorized forces rushed overland from the west to join them. At dawn on 14 November, six days after the invasion began, the Allies crossed into Tunisia and here for the first time they met Axis troops in force. The principal objectives in Tunisia were the city of Tunis and the naval base at Bizerte, less than forty miles apart. Bizerte is within easy reach of Axis airfields in Sicily, and from these fields Axis troops with light tanks and other equipment were rapidly ferried over to join the estimated 10,000 already prepared to resist an Allied conquest.

By 1 December the Allies had cut the railway line between Bizerte and Tunis and were reported to be within twelve miles of the sea at one point and within an equal distance of Tunis. The coast road from Tunis to Libya by which Rommel might escape from El Agheila remained under Axis control but an Allied column was reported advancing upon it, while a Free French column was believed to be moving northward from the French colonies in Central Africa. It seemed that the Allies were rapidly closing in from all directions upon the last strongholds of the Axis in Africa. A few days later, however, German counterattacks drove the Allied forces back from their forward positions west of Bizerte and Tunis, and it was evident in early December that there was hard fighting ahead before Axis power in North Africa could finally be destroyed.

The War in the Pacific Islands

The Solomons.—For several weeks after the Marines landed in the southern Solomons on 7 August, information concerning conditions there was meager and misleading. In September the impression prevailed that, while a great sea-battle was to be expected, there was little remaining to be done in the occupied islands but to "mop up" scattered Jap-

anese detachments. Only in October did the American people realize how desperate was the struggle for the islands and how much more remained to be done. As more complete information is released concerning the battles in the South Pacific the story that can now be told will probably have to be considerably revised.

The Japanese, it appears, were never much interested in Tulagi, Florida or other nearby islands, but they were determined from the first to recover Guadalcanal with its airfield (renamed "Henderson Field") and to drive the Marines from the small area they had been able to occupy, a beachhead seven or eight miles long and four or five deep on the northern shore of the island. Within forty-eight hours after the Americans landed, a Japanese naval force struck back, sinking not only an Australian cruiser and several other vessels as originally reported but also three American heavy cruisers. Very soon Japanese bombers began striking hard at Henderson Field and Japanese reinforcements worked their way into Guadalcanal in considerable numbers, approaching at night by short steps from island to island. These infiltration parties seem to have suffered heavy losses but still they came, and the pressure on the Americans steadily increased.

Japanese naval movements indicated that a major engagement at sea might develop at any time. On 24 and 25 August a Japanese fleet moving from the north was intercepted by an American force and the Japanese retired with considerable damage including the possible loss of a plane-carrier. This battle was apparently carried on between carrier-based planes without surface engagements.

On 13 and 14 September the Japanese made a violent effort to destroy entirely the American forces on Guadalcanal. They closed in from three sides on Henderson Field and in the bitter struggle that followed they succeeded for a time in occupying part of the field. Driven back, they filtered in again and again, but eventually they were forced by the exhausted Marines to withdraw into the jungle.

The small number of American aircraft carriers was further reduced on 15 September when the carrier *Wasp* was sunk by a submarine near the Solomons.

Another naval engagement took place on 11 and 12 October when an American task force met a Japanese task force off the northwestern tip of Guadalcanal and sank two heavy Japanese cruisers, a light cruiser and three destroyers, with the reported loss of one American destroyer.

Meanwhile, Japanese landing parties had become bolder, landing in daylight on the American side of Guadalcanal, and for weeks the Marines were fighting for their lives. They seem to have inflicted far more damage than they suffered, but they continued to be under a fearful strain. For a long time fighting was almost continuous around the beachhead.

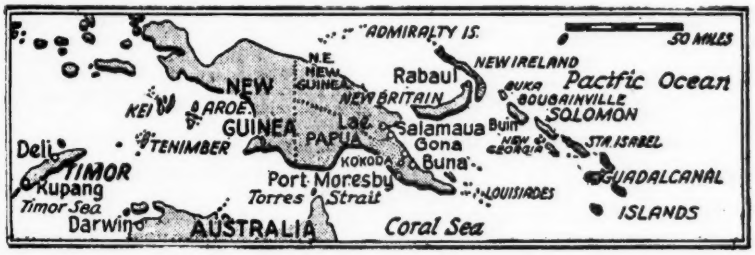
On 25 and 26 October a United States fleet engaged a strong Japanese force northeast of the islands and this time American planes sank two destroyers and damaged several other vessels. American losses included a destroyer, two smaller vessels and a plane-carrier.

By this time United States Army reinforcements had joined the Marines on Guadalcanal, and as Japanese troops continued to land on the island they seem to have met increasingly warm receptions. By mid-November the American forces were reported to have extended their beachhead to a length of sixteen miles. From their distant bases, General MacArthur's bombers frequently attacked Japanese naval concentrations at Rabaul in New Britain and at points in the upper Solomons.

The greatest naval surface battle yet fought for the islands occurred on 13 to 15 November when a strong fleet, reported by MacArthur's bombers to be heading for Guadalcanal, was intercepted by an American naval force. Evidently the Japanese intended to make this the final battle for the islands, for they were accompanied by transports carrying troops estimated to number over 20,000. As their fleet approached, the Japanese attacked Henderson Field with planes, artillery and infantry. The American Navy, however, won a decisive victory, sinking twenty-three vessels and damaging seven, according to a communiqué of 16 November. American losses included at least two light cruisers and six destroyers, with damage to several other ships. No plane-carriers were reported in this battle.

The next engagement took place on the night of 30 November when a fleet of Japanese cargo and transport ships strongly protected by destroyers was met by an American force northwest of Guadalcanal. In the battle that followed the Japanese were turned back with a loss of six warships and three other vessels. An American cruiser was reported sunk and other American ships were said to have been so badly damaged that pursuit of the enemy was not possible.

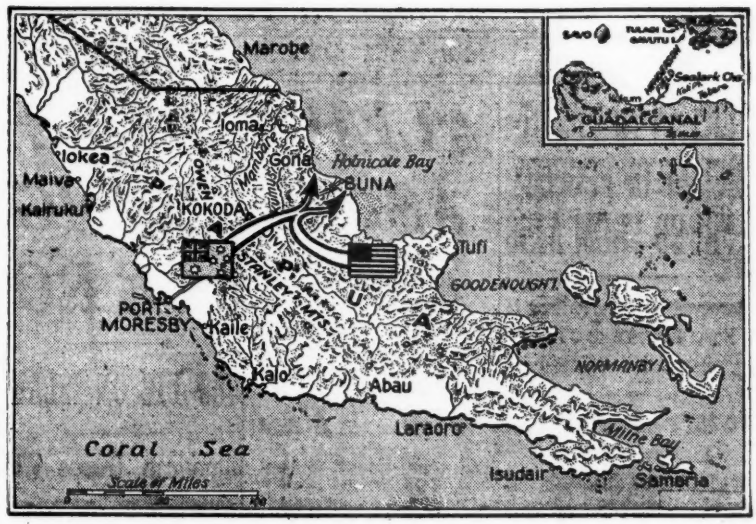
By December it appeared that the balance of sea power in the Pacific was shifting toward the United States. The proportion of both cruisers and destroyers seemed to be more favorable to the Americans than it had been before the battles in the Solomons, and with new ships being rapidly constructed in the United States there was a prospect that an absolute preponderance of naval power in the Pacific might be achieved within the coming year. The forces at Guadalcanal, however, were still in a dangerous position for apparently the Japanese were determined to recover the southeastern Solomons in spite of the cost in men and ships, and the end was not in sight.



New Guinea.—The great island of New Guinea remained divided all summer between the Japanese and the Australians. From their bases on the northern coast at Lae, Salamaua, Gona and Buna, the Japanese had pushed inland during July and August as far as Kokoda, a jungle village with a small airfield in the foothills of the lofty Owen Stanley Mountains. Their use of the island for offensives against Australia was limited, however, by the strong position of the Australians at Port Moresby on the southern coast. Clearly the principal objective of the Japanese in New Guinea must be the removal of this obstacle from their path.

In the last week of August a Japanese attempt to seize Milne Bay at the southeastern tip of New Guinea failed completely and left the Australians apparently in a strong position in that area. Unable to reach Port Moresby by sea, the Japanese next attempted the overland route.

On 8 September it was reported that they were moving from Kokoda southward into the mountains. Using their well-known infiltration and outflanking tactics, they required only a few days to get past the gap at the highest point on the trail and by the end of September they had arrived within thirty-two miles of Port Moresby. However, their supply problems seem to have proved too much for them. Many of those who got over the mountains were later found to have died of starvation as well as of malaria



and dysentery, and when the Australians finally launched a determined counterattack the Japanese were unable to resist them. While General MacArthur's bombers pounded at the enemy's supply lines, United Nations troops advanced all the way to the gap without meeting resistance. Light contact was made with the Japanese in the mountains but the battles which were expected there seem never to have developed, and on 3 November the Allies announced the recovery of Kokoda without serious opposition.

United Nations forces pushed on until they reached the northern coast, and they soon reduced the areas occupied by the Japanese to mere beachheads around the villages of Buna and Gona. With General MacArthur in personal command, American troops seem to have devoted their attention principally to Buna while the Australians attacked Gona fifteen miles up the coast. At these points the Japanese were clearly determined to resist to the limit. Several Japanese vessels—warships, landing boats and cargo carriers—as well as many planes were destroyed in attempts to reinforce and supply the defenders of the beachheads. Allied planes heavily bombed the supply routes and the Japanese bases at Lae and Salamaua in New Guinea and at Rabaul in New Britain, while the American and Australian ground forces attacking Buna and Gona measured their gains in yards. Reports from Australia dated 10 December stated that the Allies had finally taken Gona and that the attack on Buna was progressing favorably.

The War in Asia

China and Burma.—Nearly all the extensive territory conquered by the Japanese during their summer campaign in east-central China was abandoned by their forces in late August and in September, and the invaders retired for the most part to their former positions. Just why this retreat took place never became clear, but it was widely assumed that the Japanese had withdrawn voluntarily to release troops for more fruitful operations elsewhere. The mystery was deepened, however, by the fact that the withdrawal was not conducted in an orderly and methodical manner. According to Chinese reports, the Japanese fought hard at every point and always paid a high price in men and matériel before abandoning a position, and in some cases they counterattacked with vigor to recover lost ground. Nevertheless, the Chinese seemed convinced that Japanese troops were being withdrawn either for an attack on Siberia, a drive into India, or a push up the Burma road into southwestern China. When December arrived there had been as yet no Japanese drive in any of these directions. By that time the monsoon season with its torrential rains had ended in Burma, although the roads were still probably too muddy for extensive troop and supply movements. Aerial reconnaissance conducted from India and Assam failed to locate Japanese forces in a position to attack westward into India. The Chinese, however, claimed that the Japanese had 30,000 men with collapsible boats and full equipment massed on the Salween River ready to cross it and drive up the Burma road toward Kunming and on to Chungking, capital of the fighting Chinese government.

In China, United States Army and Royal Air Force planes were active. Raids were conducted far into the north (to Linhsi) and southward into French Indo-China (Haiphong), as well as to Hong Kong and many points nearer the Allied airdromes in central China. Aerial activity, however, appeared to be less intense than during the summer campaigns, and this was true also of ground action which failed to produce any significant results during October and November.

In Assam, across the border from Burma, American ground forces were reported to have completed a series of airdromes and supply points from which matériel could be flown into China. Late in October, just at the end of the monsoon season, the Japanese delivered a surprise attack on the terminus of this aerial "Burma road" and destroyed several American fighters and cargo planes on the ground. The Americans lashed back with a series of raids on Japanese supply points and strategic objectives in Burma. Otherwise, both sides continued to await more decisive action which was expected to begin somewhere in Asia at any time.

Madagascar

The Island of Madagascar in the hands of the Vichy French was for a long time a danger point on the Allied trade route around South Africa to the Near East. When the British took the port of Diego Saurez on the northern tip of the island early in May, it was hoped that French officials elsewhere in the colony would cooperate with Allied interests, but the French showed just the opposite inclination. According to reports, Axis submarines continued to fuel in the island's ports and Axis agents operated freely. As a result, on 10 September the British opened an offensive along 675 miles of the northwestern coast, and after occupying the principal ports their forces moved inland to complete the conquest. The French blocked the British advance as effectively as their resources and numbers would permit, and it was not until 23 September that the capital, Tananarive, was occupied by the invading forces. The fact that the French flag was kept flying was not effective as a gesture of appeasement, and resistance continued in the south. Armistice terms were offered by the British and the negotiations that followed only served to delay the final settlement. At last, on 8 November, six months after the first British landings, the French in Madagascar signed the armistice and the island finally came under Allied control.

French resistance had seemed futile from the first, but by delaying the British advances in every way possible and then prolonging negotiations to the limit, the French for many weeks had effectively tied up considerable British military and naval forces which might have been used to advantage against the Axis elsewhere.

The Western Hemisphere

Latin America.—The only two countries in the Americas that failed to break with the Axis, Argentina and Chile, continued to cause concern to those active in the United Nations' war effort during the autumn months. On 8 October, Under Secretary of State Sumner Welles said boldly in a public speech that Argentina and Chile were being used by Axis agents as bases for the transmission of information leading to the sinking of United Nations ships, and he could not believe that they would continue to protect these agents and thus permit their neighbors to be "stabbed in the back." Angry retorts came from both the accused nations, and President Juan Antonio Ríos of Chile cancelled the visit to the United States for which he was even then preparing.

Thereafter matters began to improve. On 20 October the Chilean Cabinet resigned to leave President Ríos "absolute liberty of action," and a new Cabinet was appointed with stronger anti-Axis tendencies. Soon after this a spy ring was broken up in Chile and Argentina also undertook an investigation of activities of foreign agents. When American forces invaded North Africa in November, President Ríos sent a message to President Roosevelt praising the action and promising control of Nazi propaganda and espionage in Chile, and President Castillo sent assurances that his people watched "with solidarity and interest the efforts made by the great and friendly nation in safeguarding the security of the Americas." Thus in the diplomatic theater of the Western Hemisphere it appeared that events were taking a course highly favorable to the interests of the United Nations.

The War Effort in the United States.—During the months of autumn that completed the first year of America's participation in the world struggle, the country moved steadily in the direction of "total war." Provision was made for the fixing of industrial wages and farm prices by an anti-inflation act signed by the President on 2 October. On 13 November the draft age was reduced from 20 to 18, increasing the number of those eligible for selective service by an estimated 2,250,000. Coffee rationing became effective on 29 November, and gasoline rationing was extended to the country as a whole on 1 December.

When President Roosevelt returned on 1 October from an 8,750-mile tour of the nation's war production centers, he reported that he had found morale good, the war spirit aggressive and production 94 or 95% of the goal he had set in January. Some authorities thought his percentage a little too optimistic, but all indications showed a tremendous and increasing output of war materials of all kinds. In the vital matter of ship production, progress seemed somewhat irregular, with October's output of eighty-one new merchant ships falling twelve ships below the record production of September. Obviously there was serious need for all that could be built, with America's battle line rapidly expanding and the submarines still taking a heavy toll. "There can be no question," said Secretary of the Navy Knox in September, "but that today the submarine problem is the major problem confronting us."

An important American strategic achievement was the completion of the Alaska Highway extending almost 1,600 miles from Dawson Creek, British Columbia, to Big Delta near Fairbanks, Alaska. Work on the road was ordered in February, and its official opening on 20 November was more than three months ahead of schedule. The road is expected to facilitate the movement of supplies by air from Alaskan bases to Russia and China.

BOOK REVIEWS

HANDBOOK OF CIVILIAN PROTECTION

BY THE CIVILIAN DEFENSE COUNCIL OF THE COLLEGE OF THE CITY OF NEW YORK
184 pages . . . McGraw-Hill Book Co., Inc., New York City.

This text appears to be the answer to questions arising as to what to do in the various phases of protecting oneself, families, and property in the event of enemy air attacks. Published for all who need the information, it attempts to inform and educate the reader in its presentation of well developed chapters. The book tries to leave nothing to chance and seems to have gone deeply enough into the various aspects of Civilian Defense so that definite knowledge will be at the hand of the reader in an emergency. One of the chapters even goes into nutrition in the wartime emergency.

There are many illlustrations in the Handbook, and the inside back cover contains a good chart on chemical warfare agents. Following the main part of the book are a selected critical bibliography and two appendices: The Colleges and Civilian Defense, and Available Motion Pictures Relating to Civilian Defense.

THE MAKING OF TOMORROW

BY RAOUL DE ROUSSY DE SALES
334 pages . . . Reynal & Hitchcock, New York.

Author de Sales has lived in this country for some 10 years, and up to the Fall of France was the correspondent of the Havas agency and of *Paris-Soir*. In this book he brings into the open the question of what are the issues of World War II, which he describes as a "multidimensional crisis." The current world-wide struggle, to use the author's own language, consists of two series of conflicts.

> . . . *the vertical conflicts in which nations fight one another, and the horizontal conflicts which are ideological, political, social, and economic. The latter transcend boundaries. They are carried on within each country. They overlap purely national alliegiances, and disrupt the national fronts. They form the pattern of revolution, which serves as a backdrop for the actual battles which are carried on on land, on sea, and in the air.*

M. de Sales does not seek to offer solutions, but his book does provide a stimulus and a medium for thoughtful consideration of the impact of the forces of nationalism, collectivism and pacafism—in the past, now, and in the years ahead.

THE ARMY OFFICER'S MANUAL

BY LIEUTENANT COLONEL A. C. M. AZOY, CAC
366 pages . . . D. Appleton—Century Company, Inc., New York.

Lieutenant Colonel Azoy states in the foreword that he has attempted carefully to compile the contents to serve as a source of ready and authoritative reference on the fundamental requirements of up-to-date military knowledge and ability. The main part of the book includes eleven chapters dealing with organization of the Army, the staff and staff duties, the uniform and equipment, drill and ceremonies, military courtesies, drill and combat signals, display of basic equipment, tent pitching, pay and allowances, military correspondence and paper work, essentials of court martial, and selective service.

Following the main section are six appendices, profusely illustrated, which concern basic formations of foot troops, military symbols, service bibliography, ribbons of United States Army decorations and campaign badges, an outline of military history, and a personal service record for anyone who owns the book.

While his book still considers square divisions in dealing with units of the Army and does not contain the new pay and allowance scales, Lieutenant Colonel Azoy's volume does provide answers for many questions that might arise in the army officer's daily routines. The author says that his book intends to provide ready reference in instances where Regular Army officers have become rusty in some staff or line function and where nonprofessional officers must adjust themselves to a daily endeavor in which "few, if any, sins of omission or commission are condoned."

THE AIR-RAID SAFETY MANUAL

BY CAPTAIN BURR LEYSON
92 pages . . . E. P. Dutton & Company, Inc., New York City.

> *What you must know to protect yourself, your family and your home.*

The sub-title explains the purpose of this little paper-bound book which is among the first to make its appearance in the new and developing field of Air-Raid Safety in Civilian Defense in the United States.

The author states that his book is a summary of air-raid rules being used in this country with the additional consideration of official procedure as followed by air-raid precaution authorities in England.

Scattered throughout are sketches that serve to illustrate various sections which include Safety in Home, Methods of Protecting Windows, Air-Raid Shelters, Airplane Spotting, and Air Gas Attack, as well as some discussion of various types of bombs, a little first aid, air-raid wardens, rescue parties, and debris-clearance groups.

While this book of less than one hundred pages is of considerable value it is believed that the Government will shortly issue official directives on this subject.

Captain Leyson is a versatile writer, being the author of nine books, including this one, and co-author of "This Man La Guardia" with Lowell M. Limpus. The first of his books appeared in 1938, and with this volume, six have appeared in the last two years: Automotive Occupations, Flight Training for the Army and Navy, It Works Like This, Photographic Occupations, Wings of Defense, and The Air-Raid Safety Manual.

FIRST AID PRIMER

BY H. WENGER, M. D., AND ELEANORA SENSE
104 pages . . . M. Barrows and Company Inc., New York City.

This book is an attractively arranged volume which contains the essentials of treatment, handling, and care of sick and injured and is written in language readily understood by laymen. This little text should prove helpful to the many classes now receiving instruction in first aid in our civilian communities as there are chapters devoted to civilian defense and blackout-aids indicated in the emergencies incident to these defense measures.

PERSONAL FINANCE AND MANAGEMENT FOR THE ARMY OFFICER

BY LT. COL. CHARLES R. HUTCHINSON
185 pages . . . D. Appleton-Century Co., Inc., New York.

It is stated in the preface to this book that in time of war commissioned officers of the Army of the United States, regardless of rank or experience, are faced with extraordinary problems in the management of their personal affairs. The author presents the material in his book in the hope that it may lead to a satisfactory solution of these problems.

Opening the volume with a discussion of the junior officer's financial problem, the author proceeds in fifteen short chapters to deal with the main financial situations in an officer's daily life. Some of the chapter titles are: Pay and Allowances, Controlling Household Expenditures, Wise Spending, Credit, Insurance, Savings and Investments, Taxes, Rights of Personnel and Their Dependents in Event of Death or Disability, and Personal Estate.

While not pretending to be exhaustive in scope, the book should give the reader a good idea of the expenses to be expected in the officer's life, whether he is in the regular army or from the reserve; and the author has advanced some solutions to the problem which might provide a plan of financial control.

MECHANIZED MIGHT

BY PAUL C. ROBERG
284 pages . . . Whittlesey House, New York.

"Mechanized Might" is more than a book about the armored force and mechanized units of our army. Its subject really is "Our New Armies." The viewpoint of the author, stated in his own words is this:

> *No one arm or element can be entirely successful in modern war. Tanks alone can't win. Airplanes by themselves cannot be victorious. The modern army, a most complicated piece of machinery, is totally dependent on the functioning of all its parts.*

The author draws for us a general "over-all picture of our new armies, their organization and armaments." The ma-

terial is not, in the main, new, but it is clearly and interestingly presented. The several chapters concerning our various arms show not only their composition and organization, but also their interdependence in operation.

Two interesting chapters deal with the plan for the Battle of France and the battle itself.

The author was formerly a Major in the United States Regular Cavalry and served as a battalion commander in the last war. The thoughts presented are well illustrated by examples.

In the introduction, Lt. Gen. Robert Lee Bullard, U. S. Army Rtd., says:

> *Let the Axis Blitzkrieg upon us not unsettle us. This book shows that we are embarked, not only in training but in actual war, upon methods which, if relentlessly pressed, will defeat the Blitzkrieg.*

While this book is intended for the general citizenry, military personnel also will find the author's discussion of interest.

JAPAN'S DREAM OF WORLD EMPIRE, THE TANAKA MEMORIAL

By Carl Crow

118 pages . . . Harper Bros., New York, 1942.

The Tanaka Memorial stated:

For the sake of self-protection as well as the protection of others, Japan cannot remove the difficulties in Eastern Asia unless she adopts a policy of "Blood and Iron." But in carrying out this policy we have to face the United States which has been turned against us by China's policy of fighting poison with poison. In the future if we want to control China, we must first crush the United States just as in the past we had to fight in the Russo-Japanase War. But in order to conquer China we must first conquer Manchuria and Mongolia. In order to conquer the world, we must conquer China. If we succeed in conquering China the rest of the Asiatic countries and South Sea countries will fear us and surrender to us. Then the world will realize that Eastern Asia is ours and will not dare to violate our rights.

The Tanaka Memorial purports to be addressed to the Japanese Emperor as the work of General Baron Tanaka, who was the premier in 1927 when a conference of "civil and military officers connected with Manchuria and Mongolia" was held. The conference ended 7 July 1927. The memorial, as indicated by the above quotation, states Japan's ambitions and the steps for attaining her imperialistic goals.

The memorial was first disclosed by Chinese publicists who said a copy had come into their hands. The Japanese have alleged the document was a Chinese fabrication. However, as the author of this book comments, it was ten years to the day (7 July 1937) following the close of the conference referred to that the Manchurian dispute broke out. In the meantime, and since, Japan has taken repeated steps to carry out the program outlined in the Tanaka Memorial.

Mr. Crow also points out that although the contents of the memorial caused a great deal of surprise to those who were unfamiliar with the history of the Far East, it did not contain anything that had not been contained in Hideyoshi's letter (dated 18 May 1592 telling of his triumphal advance into Korea and his great plan for a world empire), in Lord Hotta's memorial to the Emperor (submitting the Townsend Harris Treaty which followed Commodore Perry's success in inducing the Japanese to agree to open their country to foreign trade), or in the writings or speeches of dozens of other Japanese patriots and statesmen over a period of three centuries.

The memorial itself occupies about ninety pages in the book, which can be read in an evening, and the comments of the author as well as the memorial itself are well worth reading. The book gives its readers a clearer picture of Japan's hoped-for "shape of things to come," the consummation of which it is now our mission to prevent.

PRINCIPLES OF WAR

By Carl von Clausewitz

82 Pages . . . The Military Service Publishing Co., Harrisburg, Pa.

Times change and people change in them, but the fundamental principles of warfare remain immutable through the ages. This is the thought that first occurs after reading this splendid edition of the great Prussian soldier's immortal work.

Generally regarded as the spiritual father of the German army, von Clausewitz was Marshal Blücher's chief of staff during the Napoleonic wars. He saw service in Russia with the Emperor Alexander I during Napoleon's ill-fated invasion of that country. At Waterloo he was chief of staff of the third army corps under General Thielemann.

"Principles of War" was originally written by von Clausewitz as an appendix to the third volume of his monumental work "Vom Kriege" (On War), and was intended for the military instruction of the crown prince of Prussia. It was re-published in Germany in 1936. Mr. Hans W. Gatzke of Cambridge, Massachusetts, brought it to light in its present form in 1942 for the American reading public.

ENGINEERS IN BATTLE

By Lieutenant Colonel Paul W. Thompson, *Corps of Engineers*

108 Pages . . . Military Service Publishing Company, Harrisburg, Pa.

Colonel Thompson's book, "Engineers in Battle," comes at a very opportune time when the officers of our ever-expanding armies are struggling to learn the proper roles and capabilities of the various arms. The author's presentation of his subject is as readable as any adventure story.

The varied combat functions and proper employment of Engineers can be learned from successful operations in actual war. "Engineers in Battle" is a factual account of selected operations in Europe which illustrate the proper employment of Engineers within the division combat team. Their special abilities in assault operations, barrier tactics, and stream crossing operations are shown in their proper relationship to companion, but not rival, arms. The use of modern equipment, the increasing use of high explosives in war, and premium set upon mobility in operations are well illustrated. This book may be read with considerable profit by all engaged in our current war effort.

THE BACKGROUND OF OUR WAR

279 Pages . . . Farrar & Rinehart, Inc., New York, N. Y.

"The Background of Our War" is a volume which should prove most useful to every Army officer. Adapted from lectures prepared by the Orientation Course, War Department Bureau of Public Relations, and amply illustrated by maps, this book provides a splendid fount of information for those who seek the "where" and "why" of the present world conflict. Among the contributors are names of such military scholars as Colonel Herman Beukema of the United States Military Academy, Lieutenant Colonel G. A. Lincoln, Corps of Engineers, Lieutenant Colonel Paul W. Thompson, Corps of Engineers, and others. The bulk of the material was furnished by the Department of Economics, Government and History, and the Department of Military Art and Engineering of the United States Military Academy.

The list of suggested readings which the book recommends provides an invaluable source of material for those officers who are called upon to instruct in the War Department Orientation Course.

HISTORY OF THE UNITED STATES ARMY

Revised Edition

By Colonel William Addleman Ganoe, *Infantry.*

640 Pages . . . D. Appleton-Century Co., New York.

Colonel Ganoe's *History of the United States Army* was originally published in 1924. It was the first attempt at an inclusive narrative history of the army, and was intended to be not merely a study of campaigns or battles or military policy, but the story of the American soldier in peace and war—"the life history," says the author, "of that institution which has been the greatest single factor in the building of our nation."

The text of the present edition is unchanged in its first 461 pages, but in place of the "Epilogue (1917-1923)," a chapter has been added entitled, "The Army Hustled Into World Wars (1917-1942)." In this chapter Colonel Ganoe takes "the opportunity to place the seventh vital and immortal builder of cur Army and defense in his true light before our country"—General Douglas MacArthur; the other six being George Washington, Frederick von Steuben, Sylvanus Thayer, Winfield Scott, Emory Upton, and Arthur Wagner. The story ends on a bitter note, with the removal of Major General Wainwright's force from Bataan to Corrigidor in April, 1942.

In the 1924 edition of this work, there were thirteen appendices containing a mass of military statistics. Of these only one appears in the new edition: Appendix A, revised to date, "Containing Names of Incumbents of All Principal Offices in the Army since its Creation." There are two new appendices, however: Appendix B, "Commanders of Larger Units in World War I," and Appendix C, "Army Pay Scale" (pay effective June 1, 1942). The bibliography is unchanged except for the addition of a score of new titles.

For every officer in the United States Army, Colonel Ganoe's book should prove both entertaining and instructive.

Library Bulletin

BOOKS ADDED TO THE LIBRARY SINCE OCTOBER 1942

ADAMS, JOHN QUINCY. — **Parties in the United States.**

ADJUTANT GENERAL'S SCHOOL, 1942. — **Orders.** A discussion and specimen copies of general orders, special orders, bulletins and circulars.

AMERY, RT. HON L.S. — **India and freedom.**

ANDREWS, MARSHALL. — **Our new army.**

ASAHI, ISOSHI. — **The economic strength of Japan.**

Australia. — **Official handbook.**

BAKER, ROBERT L. — **Oil, blood and sand.** Nazi fight for oil in the Caucasus and Middle East.

BAUMER, WILLIAM H., JR. — **West Point, moulder of men.**

BINGHAM & MOORE. — **How to interview.**

BINGHAM, WALTER. — **Aptitudes and aptitude testing.**

BIRNIE, ARTHUR. — **The art of war.**

BORNSTEIN, JOSEPH & MILTON, PAUL R. — **Action against the enemy's mind.**

BRADFORD, GERSHOM. — **A glossary of sea terms.**

Britannica book of the year, 1942.

BRYAN, LESLIE A. — **The principles of water transportation.**

CARROLL, WALLACE. — **We're in this with Russia.**

China after five years of war.

VON CLAUSEWITZ, GENERAL CARL. — **Principles of war.**

COMMERCE, DEPARTMENT OF. — **Railway and highway transportation abroad.** Trade promotion series No. 155.

COPELAND, NORMAN. — **Psychology and the soldier.**

COREY, HERBERT. — **The army means business.**

COUPLAND, R. — **The Cripps Mission.**

CRESWELL, H.T., HIRAOKA, J. & NAMBA, R. MAJORS. — **English-Japanese and Japanese-English dictionary of military terms.**

CUFF, SAMUEL H. — **The face of the war, 1931-1942.**

Cullum's biographical register, 1940, Vol. VIII of officers and graduates of the U.S. Military Academy.

CUNNINGHAM, BRYSSON. — **Port administration and operation.**

CUNNINGHAM, BRYSSON. — **Port studies.** With special reference to the western ports of the North Atlantic.

DAVIES, R.A. & STEIGER, ANDREW J. — **Soviet Asia.** Democracy's first line of defense.

DAVIS, FORREST & LINDLEY, ERNEST K. — **How war came:** An American white paper from the fall of France to Pearl Harbor.

Encyclopaedia Britannica 1942. A new survey of universal knowledge. 24 Vols.

Federal Register. Annual Index 1941.

Federal Register. Vol. 7. March, April, May, June, July, August 1942.

Federal Reporter. Second Series. Vol. 127 F. 2d; Vol. 128 F. 2d.

Federal Supplement. Cases argued and determined in the District Courts of the U.S. and the Court of Claims. Vol. 44.

FERRERO, GUGLIELMO. — **The principles of power.**

FIELD ARTILLERY SCHOOL. — **Field Artillery book 20, 1942 edition.** Military fundamentals.

FIELD ARTILLERY SCHOOL. — **Field Artillery book 30, 1942 edition.** Field Artillery fundamentals.

FIELD ARTILLERY SCHOOL. — **Field Artillery book 120, 1941 edition.** Automotive instruction.

FIELD ARTILLERY SCHOOL. — **Field Artillery book 160, 1941 edition.** Elementary gunnery.

FIELD ARTILLERY SCHOOL. — **Field Artillery book 223, 1942 edition.** Elementary tactics.

FINNIE, RICHARD. — **Canada moves north.**

FREEMAN, DOUGLAS SOUTHHALL. — **Lee's lieutenants.**

FREEMAN, ELLIS. — **Conquering the man in the street.**

FRIED, HANS ERNEST. — **The guilt of the German army.**

GALKIN, B. — **How to get a rating or a commission in the army, navy, coast guard, marines, merchant marine.**

GALLAGHER, O.D. — **Action in the east.**

GARIS, FREDERICK D. — **We Japanese.**

GAUVREAU, EMILE & COHEN, LESTER. — **Billy Mitchell.**

GOODALL, GEORGE (Edited by). — **The world war in maps.**

GRAHAM, F.P. & KULICK, HAROLD W. — **He's in the air corps now.**

GREAT BRITAIN COMMITTEE OF IMPERIAL DEFENSE. — **History of the great war. Military operations: East Africa.** Vol. I: August, 1914-September 1916.

GREAT BRITAIN WAR OFFICE. — **Field service regulations.** Vol. II. Operations — General.

GREAT BRITAIN WAR OFFICE. — **Manual of military law.** 1929. Reprinted Dec. 1939.

GREMMEL, CAPTAIN FRED, & KUBALA, PAUL & KOVACS, PAUL SERGEANTS. — **Organization and tactical fundamentals of the German army.**

GRIFFIN & SHAW, LT. COLONELS. — **School of the citizen soldier.**

GUROV, COLONEL S.G. — **Combat action of the engineer platoon.** Engineer employment in combat and operations.

HAGEN, PAUL. — **Will Germany crack?**

HARRIS, MURRAY. — **Lifelines of victory.**

HAVIGHURST, WALTER. — **The long ships passing.** The story of the Great Lakes.

HILL, RUSSELL. — **Desert war.**

Hoe Maak Ik Mij Verstaanbaar in Engeland? — How am I to be understood in England?

HOFF, EBBE CURTIS, & FULTON, JOHN FARQUHAR. — **A bibliography of aviation medicine.**

HOLMAN, GORDON. — **Commando attack.**

HOLMES, HARRY N. — **Strategic materials and national strength.**

HUNT, VIRGINIA. — **How to live in the tropics.**

HUNTINGTON & WILLIAMS. — **Business geography.**

HUTCHISON, BRUCE. — **The unknown country, Canada and her people.**

JACKSON, MAJOR DONOVAN. — **India's army.**

Jane's all the world's aircraft. 1941 edition.

Jane's fighting ships — 1941.

JOHNSON, STANLEY. — **Queen of the flat tops;** The U.S.S. Lexington and the Coral Sea battle.

KING, GENERAL CHARLES. — **An Apache princess.**

KING, GENERAL CHARLES. — **Laramie** — A story of the Sioux War of 1876.

LANGDON-DAVIES, JOHN. — **The home guard fieldcraft manual.**

LAWRENCE, CHESTER H. — **New world horizons.** Geography for the air age.

LEEMING, JOSEPH. — **Modern ship stowage.** Including methods of handling cargo at ocean terminals.

LOWENSTEIN, KARL. — **Brazil under Vargas.**

LOGAN, MALCOLM. — **The home front digest.**

LUDWIG, EMIL. — **Stalin.**

MARSMAN, JAN HENRIK. — **Escaped from Hong Kong.**

MICHIE, ALLAN A. — **Retreat to victory.**

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HEALTH PRECAUTIONS: THE AFRICAN AND ASIATIC COUNTRIES ALONG THE SOUTHERN AND EASTERN MEDITERRANEAN SEA, THE RED SEA, AND THE PERSIAN GULF. Prepared by the Division of Medical Intelligence, Preventive Medicine Service, Office of The Surgeon General, U.S. Army
MEDICAL SERVICE WITH PARACHUTE REGIMENTS. Major David E. Thomas
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AMPUTATIONS IN WAR. Colonel Norman T. Kirk

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[Procedimientos de tiro durante la noche para las armas de nuestra infanteria y caballeria.] Captain R.P. Gabriel
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THE TRANS-SAHARA (MEDITERRANEAN-NIGER) RAILWAY.
[Die Transsahara — (Mittelmeer-Niger) Bahn.] Major Prokopf

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[Falkenhayn "in nuce."] Lieutenant Colonel Obkircher
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[Angregungen und Winke für den Gefechtsdienst der Heeresbautruppen.] General Klingbeil

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THE LIGHT, MECHANIZED, FRENCH DIVISIONS ON THE WESTERN FRONT.
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[Deutsches Soldatentum: Panzerspähtrupp — immer vorn.] Sergeant Horst Romeike

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[Die Propaganda als Kriegsmittel.] General Ludwig, retired

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[Das grosse Geheimnis.] Major-General Theiss

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[Die Heeresbautruppen im Abwehrkampf der Winterschlacht 1941/1942.] General Klingbeil

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[Panzergrenadiere.] Captain Schöne of the Tank School

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[Von Trimi nach Aegypten. Der Weg einer Kampfgruppe.]

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THE GERMAN WAR AGAINST ENCIRCLEMENT.
[Der Deutsche Krieg gegen die Einkreisung.] General Liebmann

This is the German expression commonly used to denote their view of this war. They claim they are fighting against the encirclement of Germany, and the term encirclement is used here in its broadest sense without any tactical implications.

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[Wandlungen der Kriegsberichterstattung.] H.L. Zankl

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PSYCHOLOGICAL ABSTRACTS

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READER'S DIGEST

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THEY WERE EXPENDABLE. By W.L. White
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Aero = Aeroplane (Great Britain)

AF News Let = Air Force News Letter

A Med Bul = Army Medical Bulletin

A Mot = Army Motors

A Off = The Army Officer

A Ord = Army Ordnance

A Quar = Army Quarterly (Great Britain)

Art Rund = Artilleristische Rundschau (Germany)

Cav Jour = Cavalry Journal

Chem War = Chemical Warfare Bulletin

CA Jour = Coast Artillery Journal

An Cos = An Cosantoir (Ireland)

Defensa = Defensa (Mexico)

Def Nac = A Defesa Nacional (Brazil)

Deut Wr = Deutsche Wehr

Ejercito = Ejercito (Spain)

FA Jour — Field Artillery Journal

Ftg Forc = Fighting Forces (Great Britain)

Inf Jour = Infantry Journal

Jour RAMC = Journal of the Royal Army Medical Corps (Great Britain)

Jour R Art = Journal of the Royal Artillery (Great Britain)

Jour RUSI = Journal of the Royal United Service Institution (Great Britain)

Jour USII = Journal of the United Service Institution of India (Great Britain — India)

MC Gaz = Marine Corps Gazette

Mem Estado Mayor = Memorial Del Estado Mayor (Colombia)

Mil Mitt = Militärwissenschaftliche Mitteilungen (Austria)

Mil-Woch = Militär-Wochenblatt (Germany)

Mil Af = Military Affairs

Mil Eng = Military Engineer

Mil Surg = Military Surgeon

Nav Inst Proc = Naval Institute Proceedings

Ord Ser = Ordnance Sergeant

Panzer = Die Panzertruppe (Germany)

Pion = Pioniere (Germany)

QM Rev = Quartermaster Review

Rev Mil = Revista Militar (Argentina)

Rev Mil Suisse = Revue Militaire Suisse (Switzerland)

RAF Quar = Royal Air Force Quarterly (Great Britain)

Roy Eng Jour = Royal Engineers Journal (Great Britain)

Tank = The Tank (Great Britain)

Die Wehr = Die Wehrmacht

Wehr Mon = Wehrtechnische Monatshefte (Germany)

Ws & Wr = Wissen und Wehr (Germany)

GENERAL

A Jour Int Law = American Journal of International Law

Amer Leg = American Legion Magazine

Amer Mer = American Mercury

Ans A Pol Sci = Annals of the American Academy of Political and Social Science

Atlantic = The Atlantic

Collier's = Collier's

Cos = Cosmopolitan

Cur His = Current History

Fortune = Fortune

Harper's = Harper's Magazine

Jour Mod Hist = Journal of Modern History

Lib = Liberty

Life = Life

Nat Bus = Nation's Business

Nat Geog = National Geographic Magazine

New Rep = The New Republic

Newsweek = Newsweek

Pointer = The Pointer

Psy Abstracts = Psychological Abstracts

Reader's Dig = Reader's Digest

Round Table = Round Table (Great Britain)

Sat Eve Post = Saturday Evening Post

Sci Dig = Science Digest

Scien Amer = Scientific American

Time = Time

Times [London] = The Times (London) Weekly Edition

U. S. News = United States News

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